HOLDEN

BARINA

MB SERIES

AND

HOLDEN

DROVER

QB SERIES

PRODUCT INFORMATION
FEATURES & SPECIFICATIONS

Holden Barina MB Series and Holden Drover QB Series

- PRODUCT INFORMATION
- FEATURES
- SPECIFICATIONS

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GENERAL MOTORS-HOLDEN'S SALES PTY. LIMITED
SERVICE DEPARTMENT

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GENERAL INDEX
HOLDEN BARINA MB SERIES
HOLDEN DROVER QB SERIES

FOREWORD

THIS PUBLICATION HAS BEEN PRODUCED PRIMARILY TO ENABLE DEALERSHIP SERVICE PERSONNEL TO OBTAIN A BROADER UNDERSTANDING OF BARINA AND DROVER DESIGN CONCEPTS, AND THE REASONS BEHIND THE MANY FEATURES OFFERED WITH THESE VEHICLES.

THE INDICES IN THIS BOOK WILL ENABLE THE USER TO QUICKLY LOCATE ANY DESIRED SECTION.

ALL INFORMATION, ILLUSTRATIONS AND SPECIFICATIONS IN THIS BOOK ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF PRINTING.

Holden
Barina MB Series

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INTRODUCTION
EXTERIOR FEATURES
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MECHANICAL FEATURES
SPECIFICATIONS & SERVICE DATA

Introduction

Model Chart and Base Equipment

Model Designation		Base Vehicle Equipment						
GMH Model Number	Description	Engine Size/Type	Transaxle			Front Seat Type	Tyre Size	Wheel Size
			Type	Shift Location	Final Drive Ratio			
8MG68	5-door Hatchback Sedan SL/X	1.32L H.C.L4	Manual 5-speed	Floor	3.524	Bucket	145SR12	4.0B×12

List of Modules

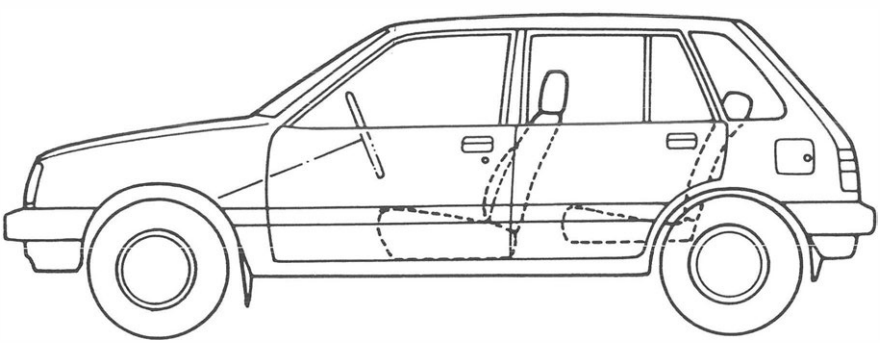
Model No.	Engine	Transaxle	F/drive	F Seat	Tyre	Wheel	Radiator	Steering	Heater
8MG68	LN5	MV2	FY5	AQ9	QQT	NW1	VA1	N51	C41

Vehicle Mass kg (estimated)

Model	Curb Total	Loaded Maximum			Shipping
		Total	Front	Rear	
8MG68	730	1180	570	610	695

Exterior Body Dimensions

Overall length	3585 mm	Wheelbase	2345 mm
Overall height	1350 mm	Track—Front	1330 mm
Overall width	1545 mm	Track—Rear	1300 mm



Barina 8MG68. SL/X, 5 door Hatchback

INTRODUCTION

The Barina MB Series is available as a 5 door SLX Hatchback.

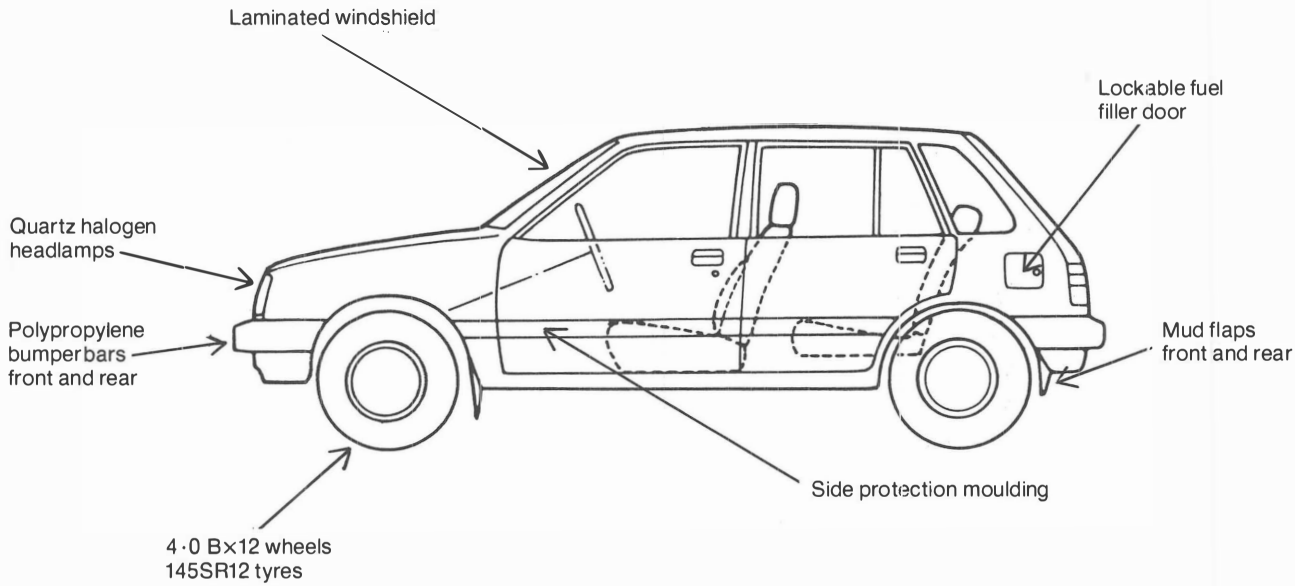
Barina is powered by a transversely mounted 1·3 litre, overhead camshaft engine which drives the front wheels through a five speed manual transaxle. The power-assisted braking system features disc front and leading/trailing drum rear assemblies. Steering is achieved through a constant ratio rack and pinion assembly.

The Holden Barina is packed with wall-to-wall features including cloth seats, padded steering wheel, AM/FM radio, carpeted interior, full instrumentation including tachometer and clock and more.

The fifth door opens to a large luggage compartment. Split rear seats make it even larger. In fact for a car of this size it's luggage carrying capacity is huge.

From the superb aerodynamic exterior styling to the styling of the interior dynamics, the Holden Barina is the car for today.

Exterior Features



Exterior Features

EXTERIOR FEATURES

Radiator grille
Plastic grille—Louvre style painted body colour

Front lamps
Headlamps—Flush mounted quartz halogen, rectangular
Park lamps—Mounted in bumper directly below headlamps.
Turn signal lamps—Mounted in bumper directly below headlamps alongside park lamps, also located on front fender above bumper bar wrap around.

Rear lamps
Combination lamp incorporating stop/tail/backup/turn signal indicators.
Licence lamp in body coloured hatch lift handle, mounted on tailgate.

Bumper bars
Polypropylene bumpers front and rear with red stripe insert.

Fuel filler door
Lockable type located on left side rear quarter.

Side protection mouldings
Black mouldings with red stripe insert.

Glass
Windshield glass is laminated non-tinted.
Side and rear glass is armour plate.
Heated rear window.

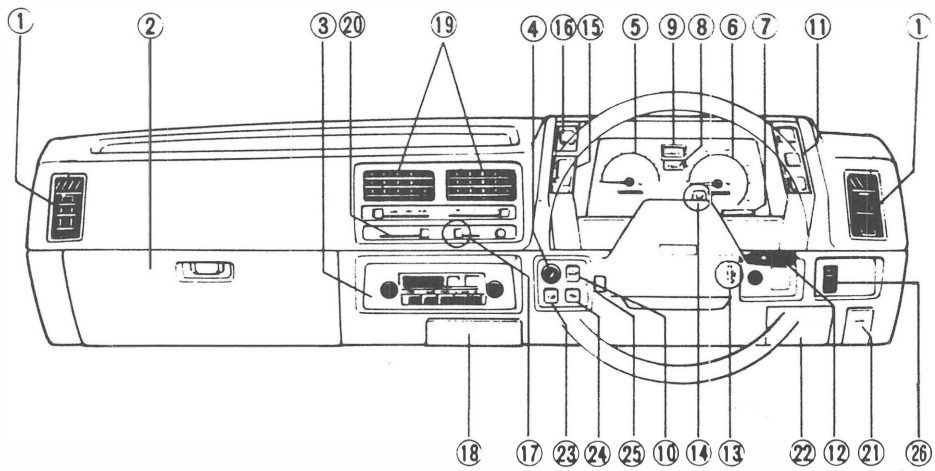
Windshield wipers
Two speed self-parking with intermittent control.
Single speed wiper with washer on rear hatch.
Wiper arms are painted non-glare black.

Wheels and Tyres
4·0 B×12 steel wheel with black wheel centre cap and silver Holden logo insert. Exposed wheel nuts.
145SR12 tubeless tyre (steel belted radial).

Mud flaps
Front/rear mud flaps as standard equipment.

Underbody
Spare wheel recessed into rear floor.

Interior Features



① Side ventilator
② Glove box
③ Radio
④ Cigarette lighter
⑤ Speedometer
⑥ Tachometer
⑦ Warning and indicator lights
⑧ Temperature gauge
⑨ Fuel gauge
⑩ Rear window defroster switch
⑪ Light switch
⑫ Turn signal and dimmer switch
⑬ Ignition switch
⑭ Hazard warning switch
⑮ Windshield wiper switch
⑯ Washer switch
⑰ Blower switch
⑱ Ashtray
⑲ Center ventilator
⑳ Heater control panel
㉑ Hood release
㉒ Fuse box
㉓ Rear window wiper switch
㉔ Rear window washer switch
㉕ Instrument light control
㉖ Electric remote hatch release

INTERIOR FEATURES

Instrument panel pad—Foam filled one piece moulding incorporates four face level adjustable fresh air vents, windscreen demisting slots and LH and RH fixed side window demisters.

Instruments

Speedometer with trip meter	Located LHS of instrument pod
Tachometer	RHS of speedometer
Fuel gauge	Central between speedo and tacho
Temperature gauge	Below fuel gauge
Clock	Digital clock below temperature gauge

Warning lamps—Low brake fluid level; Parking lamp; Battery charge; High beam; Oil pressure

Convenience items

AM/FM stereo radio	Centrally mounted below heater controls
Heater controls	Mounted above the radio, centrally in dash
Cigar lighter	Right of centre below the heater controls
Ashtray	Centrally located below radio

Steering column controls

Ignition switch/Steering lock	Right hand side of column
Combination stalk	Headlight and turn signal control on right hand side
Horn	Steering wheel pad
Hazard warning switch	Top of steering column

Additional controls

Rear window wiper & washers	Left hand lower on instrument pad to left of steering column
Rear window defroster switch	Above rear window washer switch
Electric remote hatch release	Lower right hand of instrument panel

Floor carpet—Moulded one piece non woven carpet. Rubber insert on drivers side.

Console—Moulded one piece construction incorporating storage area.

Front seat—Reclining bucket seats with head restraints. Vinyl material for backing, sides, skirts with cloth facings. Cushions and back pads are moulded from high resilience foam.

Seat belts—Seat belts are auto retracting.

Rear seats—Split folding rear seat back (fixed cushion) 50/50. Material is same as front seats.

Interior lighting—Centre mounted dome lamp with three-way switch located around rear view mirror base.

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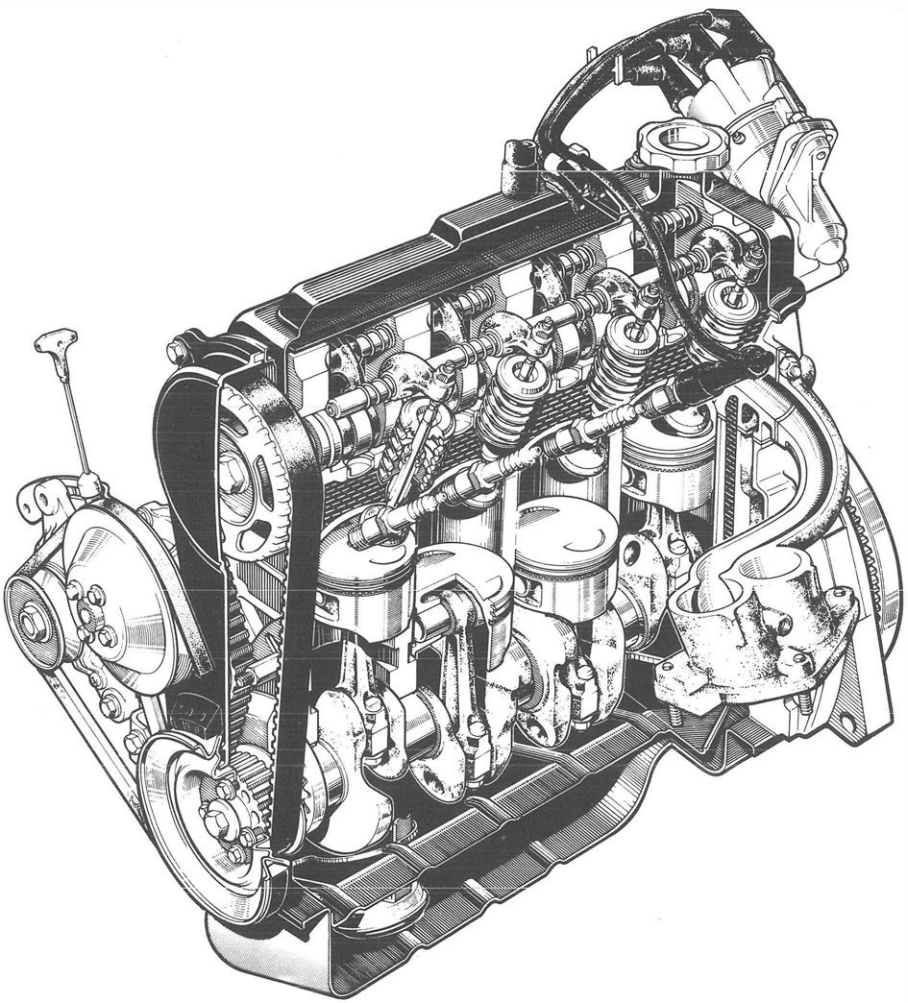


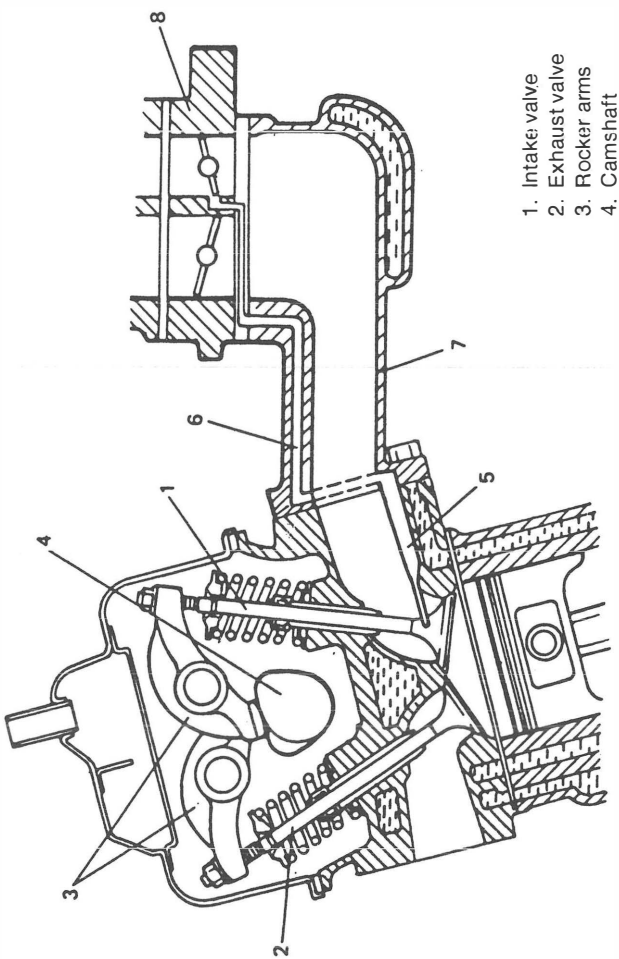
MECHANICAL FEATURES

Engine

The 1·3 litre, 4 cylinder, S.O.H.C., transversely mounted engine is designed with an emphasis on light weight, with high output and economy.

General features

- The full skirt, aluminium alloy cylinder block, has integral, cast iron cylinder liners.
- The hollow design crankshaft is made of modular cast iron, with rolled fillets.
- Camshaft drive is by a timing belt, from the crankshaft.
- Distributor drive is through a replaceable skew gear, on the rear of the camshaft.
- The single overhead camshaft is manufactured from modular cast iron and is hollow, to reduce weight. The cam profiles are quench hardened.
- The cross flow, aluminium alloy cylinder head, is fitted with replaceable valve guides and sintered alloy valve seats.
- The inclined valves are opened by the camshaft, through die-cast aluminium rocker arms, which have sintered iron slippers attached.
- Valve lash is maintained by adjusters at the valve stem end of the rocker arms.



Cylinder head and valve train

Cylinder head air induction nozzle

An air induction nozzle is provided near each intake valve to promote mixture swirl, during low air/fuel mixture flow conditions.

Camshaft and rocker arm shafts

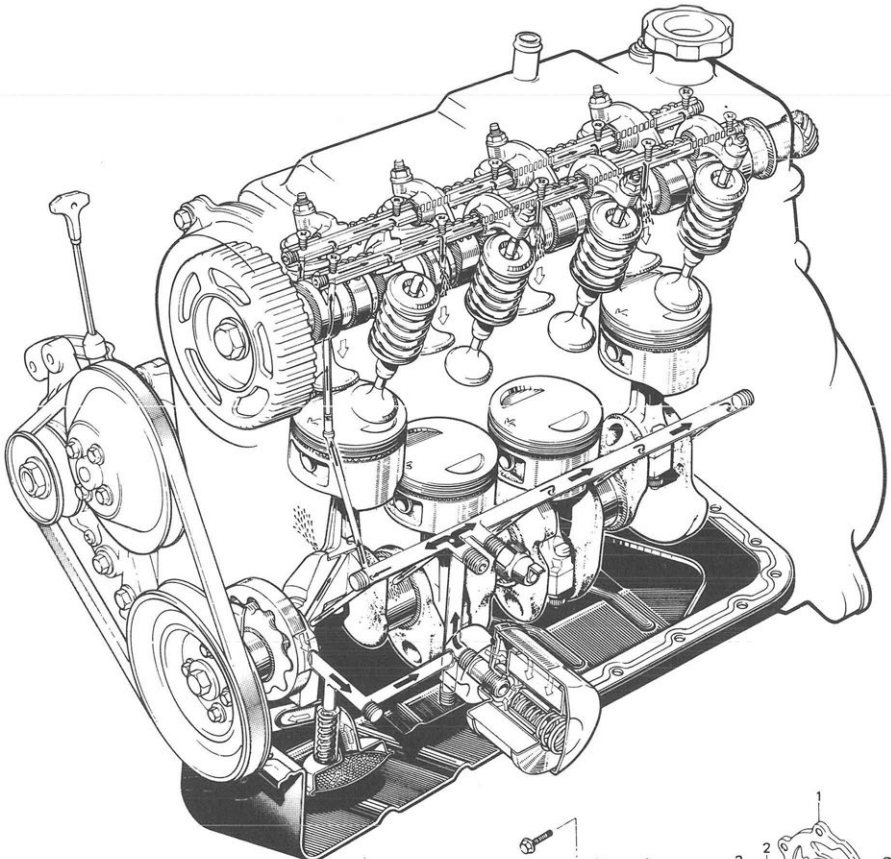
- The camshaft is removed from the transaxle end of the engine.
- The two rocker arm shafts have different oil passage drillings.

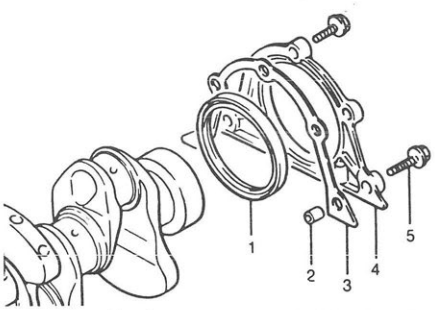
To distinguish between the two, the dimensions of their stepped ends differ.

Camshaft timing belt

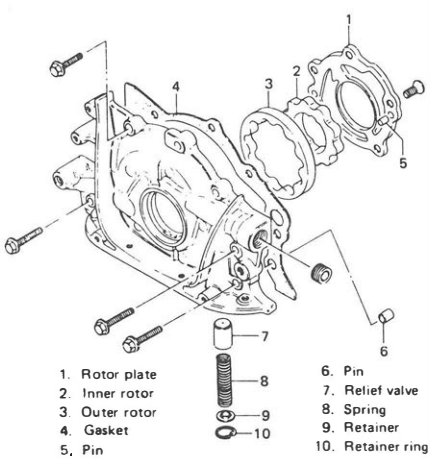
Timing belt tension is maintained by an adjustable tensioner pulley.

Specific procedures must be followed whenever the timing belt is removed, replaced or adjusted.





1. Rear oil seal
2. Pin
3. Oil seal housing gasket
4. Oil seal housing
5. Housing bolt



1. Rotor plate
2. Inner rotor
3. Outer rotor
4. Gasket
5. Pin
6. Pin
7. Relief valve
8. Spring
9. Retainer
10. Retainer ring

Engine lubrication and sealing

Engine Lubrication

Oil Flow

After passing through the pump, oil filter and main oil gallery, oil is directed to the main bearings. Through drillings in the crankshaft, oil is fed from the main bearings to the connecting rod bearings. Cylinder wall and piston pin lubrication is achieved by oil spray from the small drilling in the connecting rod.

In addition, oil is also fed from the main oil gallery, through a drilling in the cylinder block and head, to the front camshaft bearing. Oil is then fed, through two drillings in the front camshaft bearing support, to the rocker arm shafts. Valve rocker arms and valve stems and the remaining camshaft bearings are then lubricated via drillings along the length of each rocker arm shaft.

Oil pump

The internal gear type oil pump is mounted on the crankshaft pulley end of the engine, with the inner rotor being driven by two flats on the crankshaft. An oil pressure relief valve is located in the oil pump housing and is set to operate at pressures above 300 kPa.

The oil pressure switch contacts open above 30 kPa.

Engine sealing

The crankshaft oil seals are full circle, located in the oil pump housing and the rear oil seal housing, bolted to the end of the cylinder block.

The camshaft is sealed by a full circle oil seal in the front camshaft bearing support and an 'O' ring in the distributor mounting housing at the rear.

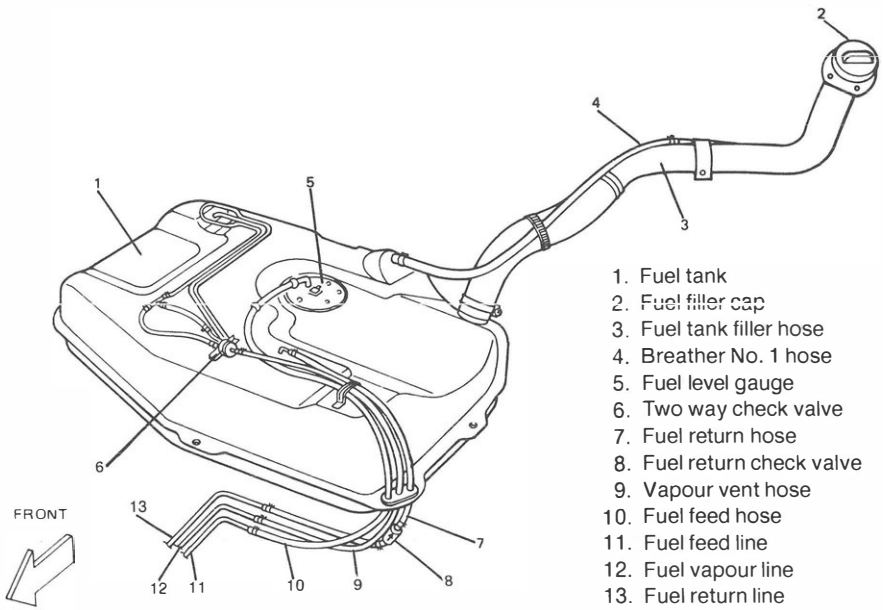
The oil pan is sealed with R.T.V. sealant.

The valve train cover is fitted with a composition gasket.

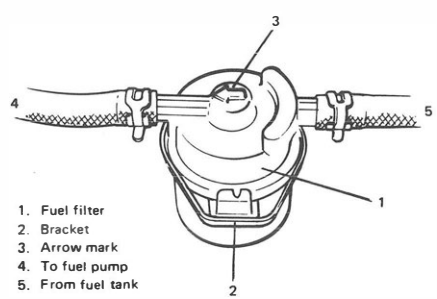
Cooling system

Engine Cooling

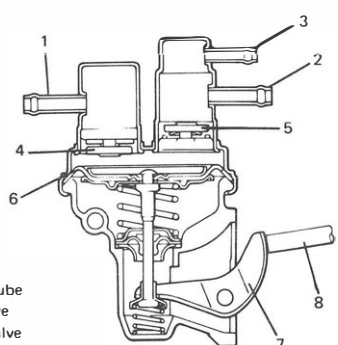
- The coolant recovery system is standard fitment.
- The radiator cap contains a pressure valve and a vacuum valve.
- Testing the radiator cap requires a small adaptor.
  Pressure relief is 90 kPa (0.9 kg/cm², 13 lb.).
- Do not remove the radiator cap to check coolant level—refer to the 'see-through' reservoir tank.
- The water pump is non-serviceable.
- The wax pellet thermostat is fitted with an air bleed valve and begins to open at 82°C—full open at 95°C.
- The electric cooling fan is activated by a thermal switch, mounted in the thermostat housing, which is located in the water heated intake manifold.
- Thermal switch operation:
  Closed contacts: 89–93°C—Fan on
  Open contacts: 84–88°C—Fan off
- The water temperature sensor is mounted in the intake manifold and is a negative temperature coefficient (NTC) type.
- The coolant consists, by volume, of 70% clean water and 30% ethylene glycol anti-freeze (GMH HN1899-M).



1. Fuel tank
2. Fuel filler cap
3. Fuel tank filler hose
4. Breather No. 1 hose
5. Fuel level gauge
6. Two way check valve
7. Fuel return hose
8. Fuel return check valve
9. Vapour vent hose
10. Fuel feed hose
11. Fuel feed line
12. Fuel vapour line
13. Fuel return line



1. Fuel filter
2. Bracket
3. Arrow mark
4. To fuel pump
5. From fuel tank



1. Inlet
2. Outlet
3. Return tube
4. Inlet valve
5. Outlet valve
6. Diaphragm
7. Rocker arm
8. Fuel pump rod

Fuel system components

Fuel System

Fuel Tank

The 31 litre fuel tank has a three line, fuel flow system:

1. Fuel feed to the pump (11), via the filter.
2. Fuel return line (13) is fitted with a check valve (8), at the tank end.
3. The fuel vapour line (12) to the charcoal canister, is fitted with a two-way check valve (6), mounted on top of the tank.

As there is no access through the body, it is necessary to remove the fuel tank to service the fuel gauge sender unit and/or the two-way check valve, on the vent line.

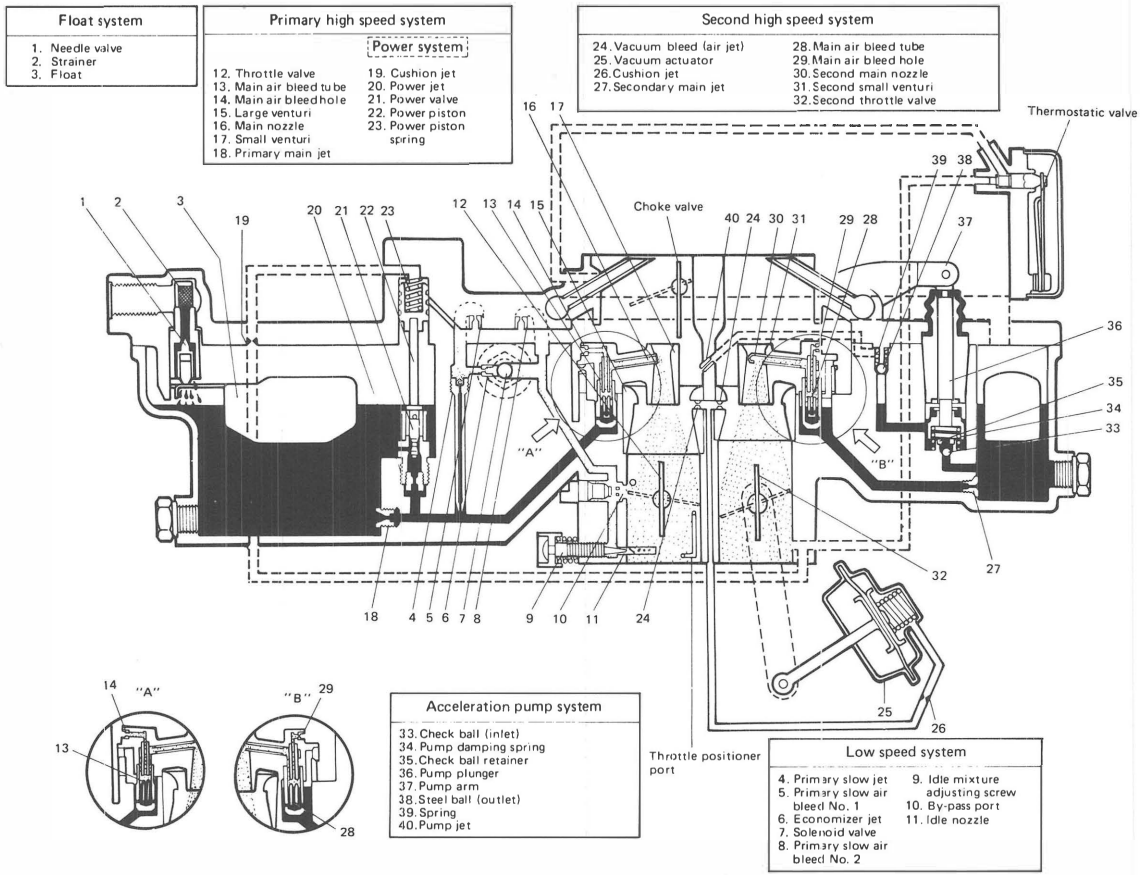
Fuel Filter

Mounted in the engine bay. The filter replacement interval is 40,000 km. An arrow indicates fuel flow. To avoid excess fuel spillage, it is recommended that the fuel tank filler cap be removed, then reinstalled, to release vapour pressure, prior to filter replacement.

Fuel Pump

The non-repairable fuel pump is mounted on the distributor end of the cylinder head and is operated by a push rod, working on a camshaft eccentric.

In addition to inlet and outlet ports, a restricted fuel return line, allows continuous pump operation. This continuous flow of fuel through the pump keeps it cool and overcomes the necessity of a 'split-link' system on the rocker arm.


Float system
1. Needle valve
2. Strainer
3. Float
Primary high speed system
Power system
12. Throttle valve
13. Main air bleed tube
14. Main air bleed hole
15. Large venturi
16. Main nozzle
17. Small venturi
18. Primary main jet
19. Cushion jet
20. Power jet
21. Power valve
22. Power piston
23. Power piston spring
Second high speed system
24. Vacuum bleed (air jet)
25. Vacuum actuator
26. Cushion jet
27. Secondary main jet
28. Main air bleed tube
29. Main air bleed hole
30. Second main nozzle
31. Second small venturi
32. Second throttle valve
Thermostatic valve
Choke valve
"A"
"B"
Throttle positioner port
Acceleration pump system
33. Check ball (inlet)
34. Pump damping spring
35. Check ball retainer
36. Pump plunger
37. Pump arm
38. Steel ball (outlet)
39. Spring
40. Pump jet
Low speed system
4. Primary slow jet
5. Primary slow air bleed No. 1
6. Economizer jet
7. Solenoid valve
8. Primary slow air bleed No. 2
9. Idle mixture adjusting screw
10. By-pass port
11. Idle nozzle

Carburettor

The AISAN carburettor is of the two barrel design, with the secondary operation being vacuum controlled.

Water heating is provided for the carburettor base and for the choke operation.

External vacuum controls fitted to the carburettor are: choke opener; idle-up diaphragm; throttle positioner; secondary diaphragm; and hot idle compensator.

Electrical control: idle stop solenoid.

Choke system
The thermo wax element reflects engine coolant temperature by expanding or contracting, thereby rotating the choke rack quadrant, changing the position of the choke butterfly valve. Rack movement is also transferred to the fast idle lever, positioning the throttle butterfly, relative to choke position.

Choke opener
On engine start, manifold vacuum is directed to the choke opener diaphragm via the choke opener 'jet' (vacuum delay valve). With a cold engine, the action of the choke opener, prevents an excessively rich mixture occurring.

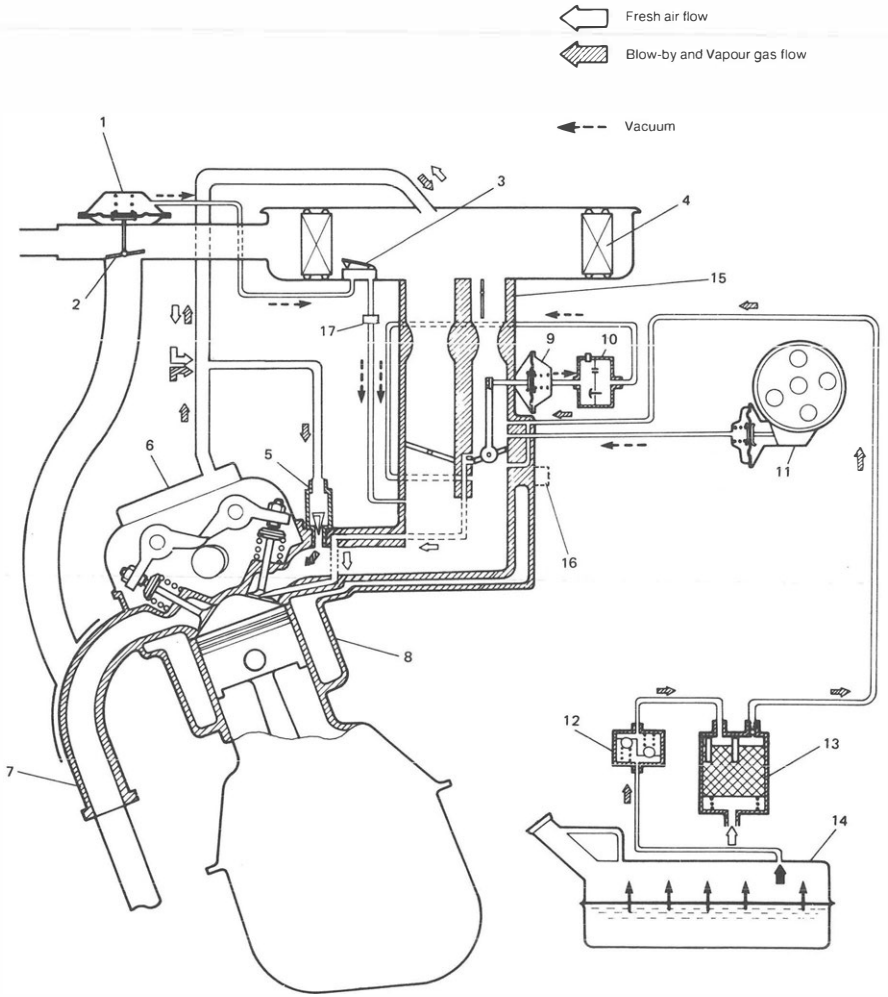
Choke unloader
A mechanical unloader, working on the throttle lever, opens the choke butterfly valve still further, preventing an excessively rich mixture, when the engine is accelerated during the warm-up stage.

Idle-up system
This system has a similar function to that of an idle load compensator.

Manifold vacuum is applied to the idle-up diaphragm when the solenoid operated, vacuum switching valve is activated and, through a mechanical linkage, the throttle butterfly is opened, to compensate for the applied load.

Circuits which activate the vacuum switching valve are: headlamps (and/or park lamps); heater fan motor; rear window heater; and engine cooling fan motor.

NOTE: When dealer fitted, the air conditioning kit contains a separate diaphragm and vacuum switching valve, to cater for this additional load.



1. Air control actuator
2. Damper
3. Thermo sensor
4. Air cleaner element
5. PCV (Positive Crankcase Ventilation Valve)
6. Cylinder head cover
7. Exhaust manifold
8. Cylinder block
9. Throttle positioner
10. Vaccum transmitting valve (VTV)
11. Distributor
12. 2-way check valve
13. Charcoal canister
14. Fuel tank
15. Carburettor
16. Plug
17. One way valve

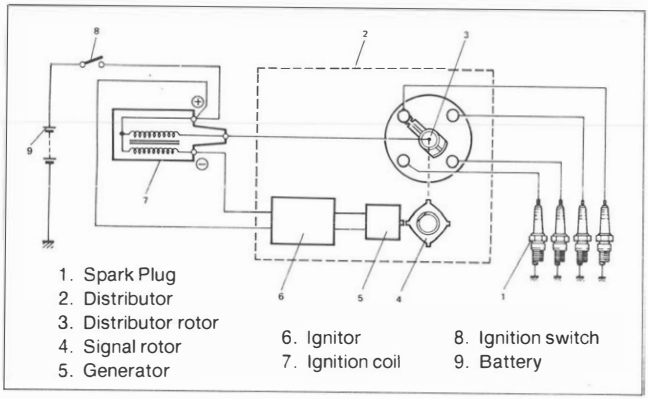
Emission Control

Crankcase
The P.C.V. valve is located between the engine ventilation hose to the air cleaner and the intake manifold.

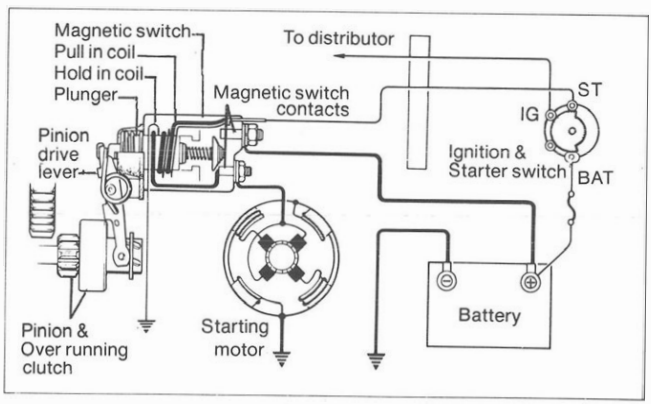
Evaporative
The non-serviceable charcoal canister is located in the engine bay.

Carburettor
Additional controls added to the carburettor are: throttle positioner; air pre-heat; and hot idle compensator.

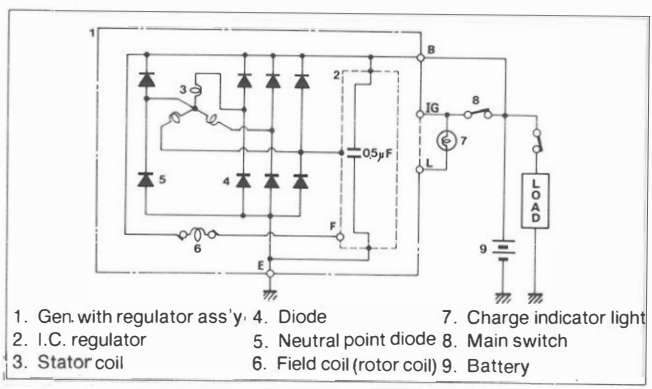
EGR system
To reduce the formation of nitrogen oxides (NO_x), an EGR system is used. The system consists of an E.G.R. valve and a bi-metal vacuum switching valve (BVSV). The operation of the system is similar to that used on other GMH products.



Ignition system



Cranking system



Charging system

Engine Electrical

Ignition system

The principal components of the ignition system are the spark plugs, ignition coil and distributor.

The transistorised Nippon Denso distributor houses the signal rotor, magnet and pick-up coil, together with the igniter and centrifugal and vacuum advance units.

When the distributor shaft rotates, the magnetic flux passing through the pick-up coil varies, due to the change in air gap between the pick-up coil and the signal rotor. The building and collapsing magnetic flux induces an alternating voltage in the pick-up coil, which switches the igniter on and off. The igniter then controls the switching of primary coil current, thereby producing the secondary, high voltage generation.

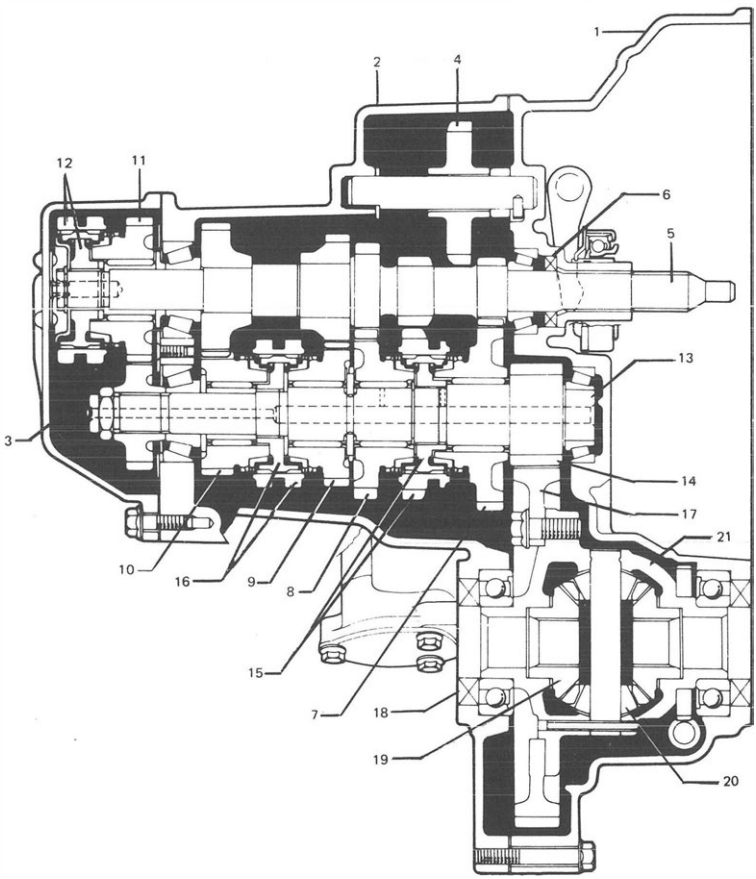
The signal rotor air gap is adjustable and can be checked by using a brass feeler strip.

Cranking system

The cranking circuit consists of the battery, starting motor, ignition switch, and related electrical wiring.

Charging system

The charging system features a solid state regulator that is mounted inside the generator. All regulator components are enclosed into a solid mould. The regulator, together with the brush holder assembly, is attached to the slip ring end frame. The regulator voltage setting cannot be adjusted.



1. Right case
2. Left case
3. Side case
4. Reverse idler gear
5. Input shaft
6. Input shaft oil seal
7. Counter shaft low gear
8. Counter shaft second gear
9. Counter shaft third gear
10. Counter shaft fourth gear
11. Input shaft fifth gear
12. Over top synchronizer hub & sleeve
13. Counter shaft
14. Final output gear
15. Low speed synchronizer hub & sleeve
16. High speed synchronizer hub & sleeve
17. Final gear
18. Differential side oil seal
19. Side gear
20. Side pinion
21. Differential carrier

CLUTCH AND TRANSAXLE

Clutch

The diaphragm spring pressure plate clamps a dry single plate disc of 190 mm diameter in a conventional manner.

Operation is by cable, with adjustment available on the clutch release arm.

Removal of the transaxle assembly is necessary, to gain access to the clutch.

Transaxle

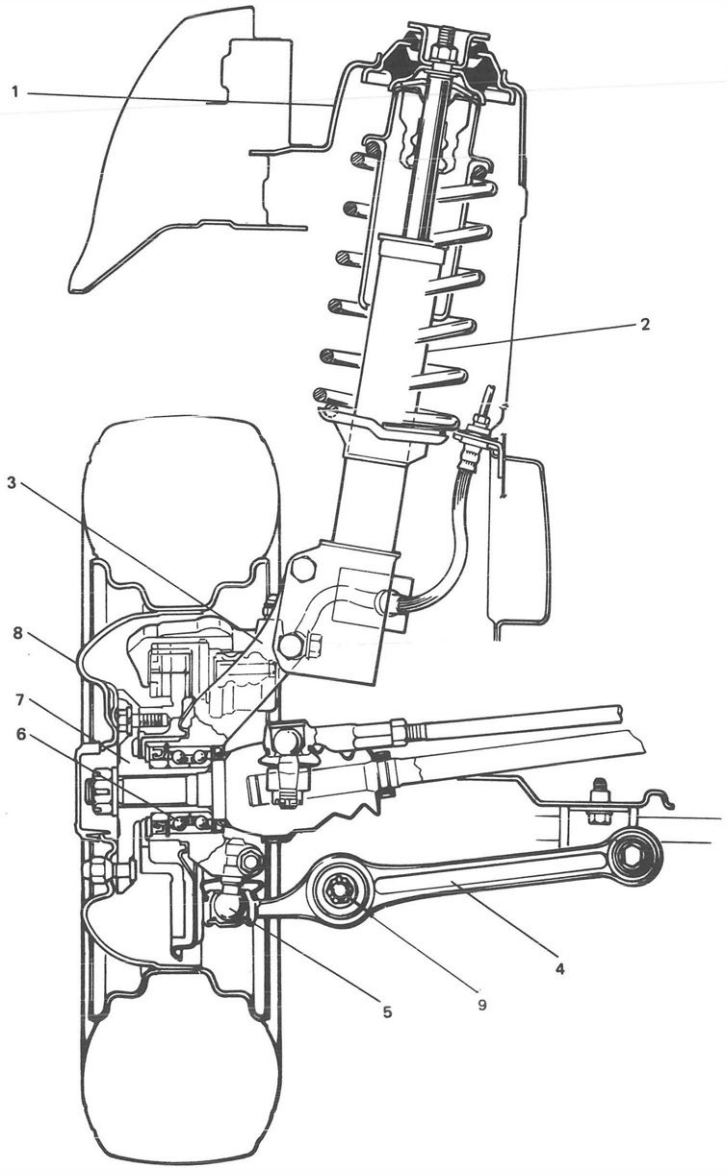
The transaxle features 5 forward ratios and one reverse. Fourth and fifth gears are overdrives.

The assembly consists of three aluminium housings which are sealed with RTV sealant.

Both the input shaft and countershaft are supported on taper roller bearings. Pre-load is set with selective shims on the fifth gear end of the transaxle housing.

The reverse idler gear is bushed and the final drive assembly is supported on two, single row ball races.

Gear ratios are:	Low	3.416
	2nd	1.894
	3rd	1.280
	4th	0.914
	5th	0.757
	Reverse	2.916

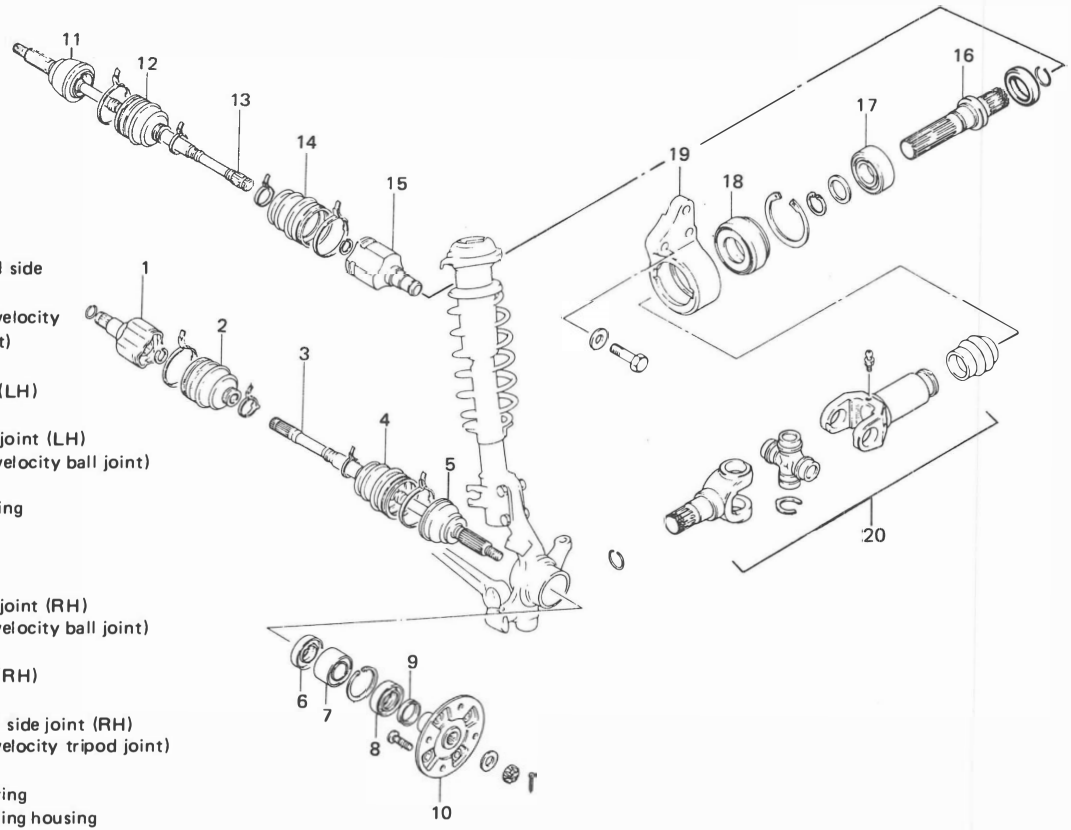


1. Car body
2. Strut asembly
3. Steering knuckle
4. Suspension control arm (lower arm)
5. Ball stud
6. Wheel bearing
7. Front wheel hub
8. Wheel
9. Stabilizer bar

FRONT SUSPENSION AND DRIVE AXLES

Front Suspension

- The front suspension is MacPherson strut type.
- The rubber mounted stabilizer bar maintains the non-adjustable caster angle.
- The strut damper is non-serviceable.
- The front hub is mounted on a double row thrust ball race.



1. Differential side joint (LH) (Constant velocity tripod joint)
2. Boot
3. Drive axle (LH)
4. Boot
5. Wheel side joint (LH) (Constant velocity ball joint)
6. Oil seal
7. Wheel bearing
8. Oil seal
9. Spacer
10. Wheel hub
11. Wheel side joint (RH) (Constant velocity ball joint)
12. Boot
13. Drive axle (RH)
14. Boot
15. Differential side joint (RH) (Constant velocity tripod joint)
16. Inner shaft
17. Center bearing
18. Center bearing housing
19. Center bearing support
20. Universal joint ass'y

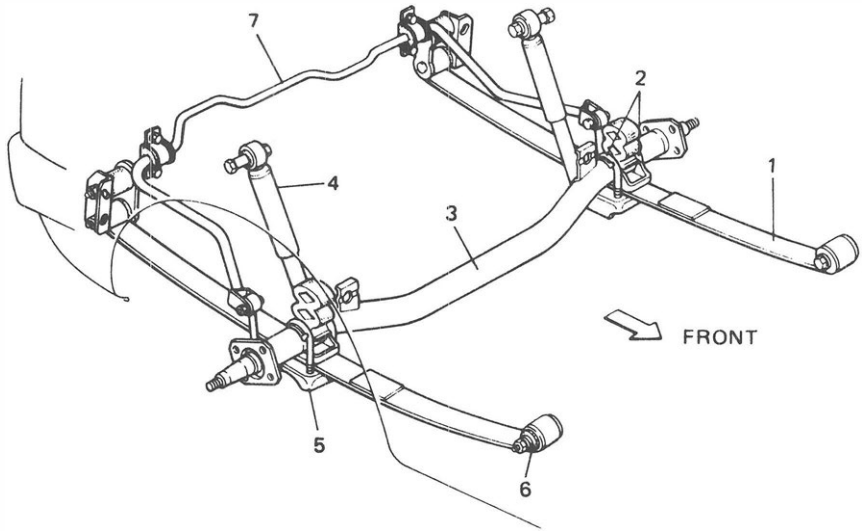
Drive Axles

Each drive axle has a Rzeppa universal joint on the outer end, with a tripod, on the inner.

While both drive axles are the same length, the RH axle, has an inner shaft to make up the length difference between the transaxle and the right hub. This inner shaft has a Hookes universal and sliding yoke on the final drive end and is supported by a sealed, centre bearing on its outer length.

The tripod joint and housing are replaceable units but the outer, Rzeppa joint is non-serviceable and, if worn, must be replaced as an assembly, with the drive axle.

The inner shaft assembly, is fully serviceable, in that the universal joint and sealed centre bearing are both replaceable.



1. Leaf spring
2. U-bolt
3. Rear axle
4. Shock absorber
5. Spring seat
6. Bushing
7. Rear stabilizer bar

REAR SUSPENSION AND REAR AXLE

The single piece, tubular rear axle is supported by single leaf springs. Body roll is controlled by a stabilizer bar and damping is achieved by two tubular shock absorbers.

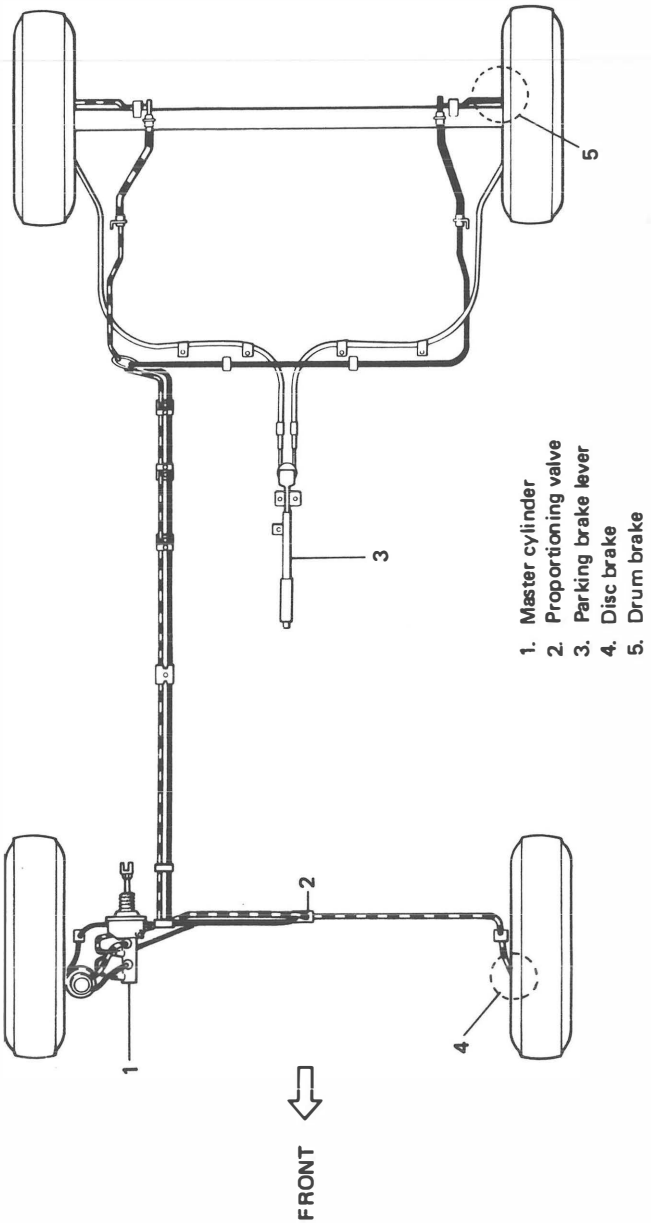
Axle bearings are twin, single row ball races.

Steering gear

STEERING

The steering system used is rack and pinion, with a fixed ratio of 17·897:1.

The steering shaft has two universal joints located inside the passenger compartment.



Braking system

BRAKES

The braking system is a diagonal split design with 210 mm front discs and 180 mm rear drums. Hydraulic pressure is developed by a compensating port design tandem master cylinder 19·05 mm diameter, assisted by a power booster (effective diameter—155 mm). A proportioning valve is mounted separate to the master cylinder, on the dash panel.

Brake fluid level warning lamp

The brake fluid level should be maintained between the 'Max' and 'Min' lines on the master cylinder reservoir.

The master cylinder reservoir cap, incorporates an electrical switch which, when activated, when fluid level approaches the 'Min' mark, will illuminate the brake fluid level warning lamp on the instrument panel.

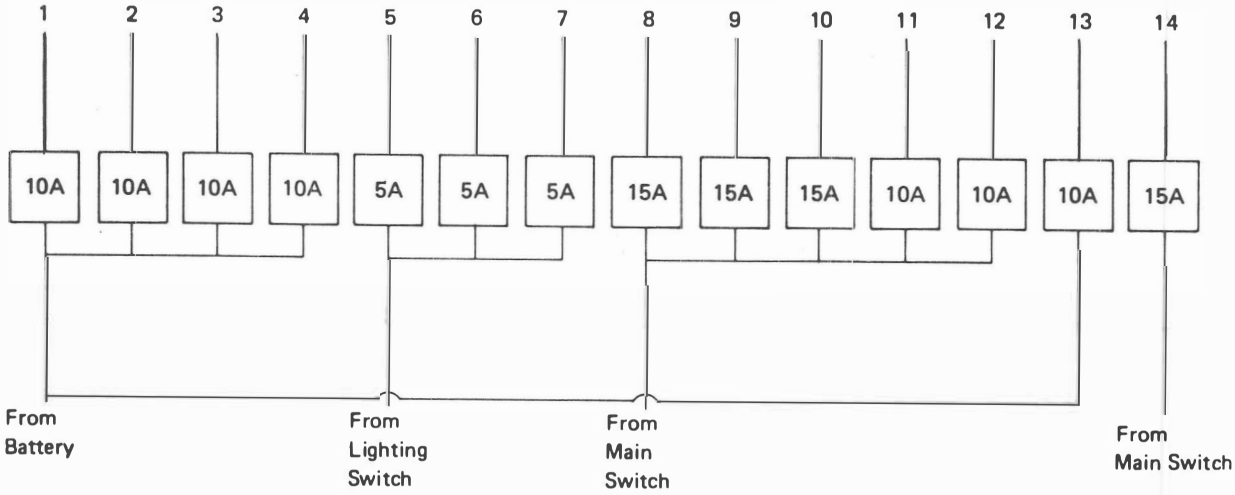
With the engine stationary and the ignition 'ON', the warning lamp is illuminated regardless of fluid level as a check of the electrical circuit integrity. The warning lamp circuit is grounded via the charging system so that with the generator charging, the warning lamp is extinguished if the brake fluid level is satisfactory.

Discs and drums

A single piston (51·1 mm bore) floating design caliper is used for the front discs.

The rear, leading/trailing drum brakes are self adjusting with the parking brake actuating lever incorporated in the assembly.

Barina fuse layout



1. Head Lamp RH
2. Head Lamp LH
3. Stop Lamp
4. Interior (dome) Lamp, High Beam Indicator
5. Licence Lamp, Instrument Illumination
6. Small Lamp RH, Tail Lamp RH
7. Small Lamp LH, Tail Lamp LH
8. Ignition Coil, Distributor, Meter
9. Heater
10. Rear Defogger
11. Wiper, Washer
12. Turn Signal Lamp, Back Up Lamp
13. Hazard Warning Lamp
14. Radio, Cigar Lighter

BODY ELECTRICAL

Barina is equipped with conventional body electrical circuitry.

Fusible link
To protect the ignition, accessory and convenience item circuits, a fusible link is provided at the battery positive terminal.

Fuses
Fourteen (14) blade type fuses are used for circuit protection and are located in the fuse block, at the right hand side of the steering column, in the lower dash area.

The location, purpose and value of individual fuses, are as shown.

Relays
The only relays provided are:
Turn signal—Located on top of the fuse block. Access can be gained from under the dash.

Intermittent wiper—Incorporated in the wiper switch assembly.

Windshield wiper/washer
FRONT: The wiper fitted is a two-speed unit (high speed and low speed, and intermittent) with a self-park facility.

The washer motor is mounted in the base of the water reservoir.

REAR: A single speed wiper motor is mounted in the hatch door and the washer motor and reservoir, in the right hand rear quarter panel.

Headlamps
Battery voltage is applied to both lamps—the switch provides an earthing circuit. The body earth connection is located on the right hand kick panel, behind the dash.

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Electrical 58

Specifications

ENGINE		
Type	4 – stroke cycle, water cooled, OHC	
Number of cylinders	4	
Lubrication system	Wet sump	
Bore	74.0 mm	(2.91 in)
Stroke	77.0 mm	(3.03 in)
Piston displacement	1,324 cm^3	(80.8 cu. in)
Carburetor	AISAN, Two barrel down draft type	
Air cleaner	Dry type, Polyester fiber element	
ELECTRICAL		
Ignition timing	8°(4°) B.T.D.C. at 700± 50 r/min (rpm)	**NOTICE:** **For detail of ignition timing data, refer to Barina Service Manual.**
Standard spark plug	NGK: BP6ES NIPPON DENSO: W16EX-U	
Starter	Magnetic shift type	
Generator	Alternator	
Battery	NT60S-4 type: 12V 126kC (35AH)/20HR	
Headlight	12V	60/55W
Turn signal light	12V	21W
Small light	12V	5W
Tail/Brake light	12V	5/21W
Side turn signal light	12V	5W
Licence plate light	12V	7.5W
Back up light	12V	21W
Interior light	12V	5W
Meter pilot lights	12V	3.4W
Fog light (optional)	12V	21W
Main fuse	0.5 mm^2 (fusible link)	
Fuse box	10/10/10/10/5/5/5/15/15/15/ 10/10/10/15A	

TRANSAXLE		
Clutch type		Dry, single disc
Transaxle type		5-forward all synchromesh, 1 reverse
Final reduction ratio		3.523
Gear ratios: Low		3.416
2nd		1.894
3rd		1.280
4th		0.914
5th		0.757
Reverse		2.916
WHEELS AND SUSPENSION		
Tyre size: Front and rear		145 SR12
Tyre pressure	Front	220 kPa
	Rear	220 kPa
Suspension type	Front	Strut
	Rear	Leaf spring
STEERING		
Turning radius		4.6 m
Steering gear box		Rack and pinion
Toe-in		0 ~ 4 mm
Camber angle		1° 00′ ± 1°
Caster angle (Trail)		3° 10′ ± 2°
King pin angle		12° 50′ ± 3°
BRAKE SYSTEM		
Type		4 – wheel, hydraulic, power assisted
Wheel brake	Front	Disc brake (floating caliper type)
	Rear	Drum brake (leading and trailing)
Parking brake		Mechanical, actuated on rear wheels
CAPACITIES		
Cooling solution		4.7 ℓ
Fuel tank		31.0 ℓ
Engine oil		4.0 ℓ
Transaxle oil		2.3 ℓ

Service Data

Item				Standard
Compression pressure				14.0 kg/cm² (199.0 psi)/400 r/min (rpm)
Valve lash (clearance)		Cold (When coolant temperature is 15 ~ 25°C or 59 ~ 77°F)	Inlet	0.13 ~ 0.17 mm
			Exhaust	0.16 ~ 0.20 mm
		Hot (When coolant temperature is 60 ~ 68°C or 140 ~ 154°F)	Inlet	0.23 ~ 0.27 mm
			Exhaust	0.26 ~ 0.30 mm
Cylinder head	Valve seat	Seating width	Inlet	1.3 ~ 1.5 mm
			Exhaust	1.3 ~ 1.5 mm
		Seating angle		45°
	Valve guide hole diameter (In & Ex)			12.030 ~ 12.048 mm
Valve, valve spring & cam shaft	Camshaft/Journal clearance			0.050 ~ 0.091 mm
	Cam height (Base circle + lift)		Inlet	37.500 mm
			Exhaust	37.500 mm
			Fuel pump cam	40.000 mm
	Valve stem diameter		Inlet	6.965 ~ 6.980 mm
			Exhaust	6.950 ~ 6.965 mm
	Valve guide I.D.		Inlet	7.000 ~ 7.015 mm
			Exhaust	7.000 ~ 7.015 mm
	Valve guide-to-valve stem clearance		Inlet	0.020 ~ 0.050 mm
			Exhaust	0.035 ~ 0.065 mm
	Thickness of valve head periphery		Inlet	1.0 mm
			Exhaust	1.0 mm
	Contact width of valve and valve seat		Inlet	1.3 ~ 1.5 mm
			Exhaust	1.3 ~ 1.5 mm
	Valve spring free length		Inlet	49.3 mm
			Exhaust	49.3 mm
	Valve spring preload		Inlet	24.8 ~ 29.2 kg at fitting length 41.5 mm
			Exhaust	24.8 ~ 29.2 kg at fitting length 41.5 mm

Item			Standard
	Valve guide protrusion (In. & Ex.)		14 mm
Rocker arm shaft and rocker arm	Rocker shaft O.D.		15.973 ~ 15.988 mm
	Rocker arm I.D.		16.000 ~ 16.018 mm
	Shaft-to-arm clearance	Inlet	0.012 ~ 0.045 mm
		Exhaust	0.012 ~ 0.045 mm
Cylinder	Flatness of gasketed surface		0.03 mm
	Cylinder bore (S.T.D.)		74.00 ~ 74.02 mm
	Cylinder-to-piston clearance		0.02 ~ 0.04 mm
Piston	Piston diameter	Standard	73.970 ~ 73.990 mm
		Over size: 0.25 mm (0.0098 in.)	74.220 ~ 74.230 mm
		Over size: 0.50 mm (0.0196 in.)	74.470 ~ 74.480 mm
	Piston ring groove width	Top ring	1.22 ~ 1.24 mm
		2nd ring	1.51 ~ 1.53 mm
		Oil ring	2.81 ~ 2.83 mm
	Piston pin diameter		16.995 ~ 17.000 mm
Piston ring	Piston ring thickness	Top ring	1.17 ~ 1.19 mm
		2nd ring	1.47 ~ 1.49 mm
		Oil ring	0.45 mm
	Ring clearance in groove	Top ring	0.03 ~ 0.07 mm
		2nd ring	0.02 ~ 0.06 mm
	Piston ring end gap	Top ring	0.20 ~ 0.33 mm
		2nd ring	0.20 ~ 0.35 mm
		Oil ring	0.20 ~ 0.70 mm
Crankshaft			
	Crank pin diameter		41.982 ~ 42.000 mm
	Crank pin clearance in con. rod		0.030 ~ 0.050 mm
	Connecting rod small end bore		16.968 ~ 16.979 mm
	Crank journal diameter		44.982 ~ 45.000 mm
	Bearing-to-journal clearance		0.020 ~ 0.040 mm

Item		Standard
Crankshaft		
	Crankshaft thrust play	0.11 ~ 0.31 mm
	Connecting rod big end side clearance	0.10 ~ 0.20 mm

CLUTCH & TRANSAXLE

Item			Standard
Clutch	Pedal free travel		20 ~ 30 mm
	Facing wear (Rivet head depth)		1.5 mm
	Clutch release arm play		2 ~ 4 mm
Transaxle	Clearance between gears and rings		1.0 ~ 1.4 mm
	Key slot width of synchronizer ring	Low	8 mm
		2nd	10 mm
		3rd, 4th, 5th	9.6 mm
	Gear shift fork shaft spring free length		35.5 mm
	Gear shift & select shaft spring free length		19.5 mm
	Reverse gear shift arm spring free length		19.5 mm

LUBRICATION

Item			Standard
Lubrication			
	Oil relief valve spring	Free length	45 mm
	Set pressure of oil pressure switch		0.2 ~ 0.4 kg/cm^2 (2.84 ~ 5.68 psi)
	Engine oil pressure		3.0 ~ 4.2 kg/cm^2 (42.7 ~ 59.7 psi) at 3,000 r/min (rpm)

COOLING SYSTEM

	Item	Standard
Cooling system	Fan belt tension as deflection under 10 kg (22 lb) push applied to middle point between pulleys	6 ~ 9 mm
	Thermostat start-to-open temperature	82°C
	Thermostat full-open temperature	95°C
	Valve lift	8 mm

DIFFERENTIAL

	Item	Standard
Differential	Side gear backlash	0.01 ~ 0.25 mm
	Side gear thrust play	0.05 ~ 0.33 mm

CARBURETTOR

Item		Standard
Engine idle speed		700 ± 50 r/min (rpm)
Engine idle speed when lighting switch "ON"		800 ± 50 r/min (rpm)
Float level	When measuring with special tool	20.5 ~ 23.5 mm
	Float height	7 mm

STEERING SYSTEM

Item	Standard
Gear ratio	17.897
Steering angle, inside	38°
Steering angle, outside	32°
Steering wheel play	0 ~ 30 mm

BRAKES

Item	Standard
Front brake disc thickness	10 mm
Front brake pad thickness (lining + pad rim)	15.0 mm
Rear brake lining thickness (lining + shoe ring)	5.8 mm
Rear brake drum inside diameter	180 mm
Pedal play	1 ~ 8 mm
Pedal arm-to-wall clearance: When pedal is depressed at 30 kg (66 lb)	85 mm minimum

ELECTRICAL

Item		Standard
Ignition system	Ignition order	1 – 3 – 4 – 2
	Signal rotor air gap	0.2 ~ 0.4 mm
	Generator resistance	130 ~ 190 ohms
	High tension cord resistance	16kΩ/3.3 ft (1 m)
	Ignition coil; Primary coil resistance (cold)	1.06 ~ 1.43 ohms
	Ignition coil; Secondary coil resistance (cold)	10.8 ~ 16.2 kilohms

	Item	Standard
Starter motor	Voltage	12 Volts
	Output	0.8 kw or 0.9 kw
	Rating	30 seconds
	Brush length	16 mm
	Number of pinion teeth	8
	Commutator diameter	28 mm
	Mica depth	0.5 ~ 0.8 mm
	Commutator out of round	0.05 mm or less
	Brush spring tension	1.6 kg
Charging system	Nominal operating voltage	12 Volts
	Maximum alternator output	45A
	Maximum permissible alternator speed	15,000 r/min (rpm)
	Working temperature range	$-30 \sim 90^{\circ}C$
	Rotor; Ring-to-ring circuit resistance	2.8 ~ 3.0 ohms
	Brush length	11.0 mm
	Standard output voltage and current	14.2 ~ 14.8 Volts, 10A maximum
	Regulated Voltage	14.2 ~ 14.8 Volts

Holden Drover QB Series

SECTION INDEX

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EXTERIOR FEATURES

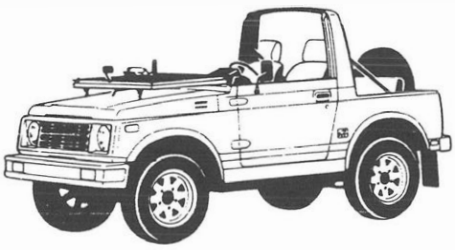
INTERIOR FEATURES

MECHANICAL FEATURES

SPECIFICATIONS & SERVICE DATA

Introduction

8QS26 [CANVAS TOP (Half metal door)]

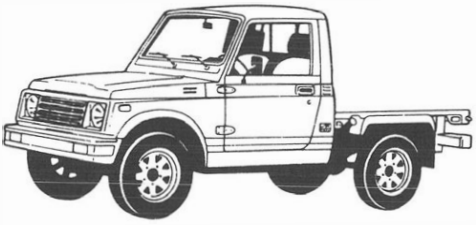


8QS16 (METAL TOP)

8QT16 (METAL TOP, 4-Seat High Roof Deluxe)

8QS80 (PICK-UP)

8QS60 (CHASSIS CAB)



Drover Model line-up

INTRODUCTION

The Drover QB Series is available in five models, three compact, multi-purpose, four wheel drive vehicles and two four wheel drive light commercials.

The Drover line-up consists of the following models:

- 8QS26—Half door, soft top, sport wagon
- 8QS16—Hard top wagon
- 8QT16—High roof hard top wagon
- 8QS80—Two door pick-up
- 8QS60—Two door chassis cab.

Model Chart and Base Equipment

Model Designation		Base Vehicle Equipment						
GMH Model Number	Description	Engine Size/Type	Transmission			Front Seat Type	Tyre Size	Wheel Size
			Type	Shift Location	Final Drive Ratio			
8QS60	2 door Chassis Cab	1·32L H.C.L4	Manual 5 speed	Floor	3.909	Bucket	6.00×16 4 PR	6.00JJ×16
8QS80	2 door Pick-up						6.00×16 4 PR	6.00JJ×16
8QS26	Wagon Sport half door Soft Top						FR78—15 4 PR	5.5JJ×15
8QS16	2 door Wagon Hard Top						FR78—15 4 PR	5.5JJ×15
8QT16	2 door Wagon High Roof Hard Top						FR78—15 4 PR	5.5JJ×15

Vehicle Dimensions and Weights

	8QS26	8QS16	8QT16
Overall length	3 430 mm	3 440 mm	⇐
Overall width	1 460 mm	⇐	⇐
Overall height	1 680 mm	1 690 mm	1 840 mm
Wheelbase	2 030 mm	⇐	⇐
Tread, front	1 210 mm	⇐	⇐
rear	1 220 mm	⇐	⇐
Ground clearance	225 mm	⇐	⇐
WEIGHT			
Curb weight	860 kg	870 kg	910 kg
Gross axle weight rating, front	515 kg	⇐	⇐
rear	805 kg	825 kg	⇐
Gross vehicle weight rating	1 320 kg	1 340 kg	⇐
Seating capacity	2 persons	⇐	4 persons

	8QS80	8QS60
Overall length	3 890 mm	⇐
Overall width	1 460 mm	⇐
Overall height	1 680 mm	⇐
Wheelbase	2 375 mm	⇐
Tread, front	1 210 mm	⇐
rear	1 220 mm	⇐
Ground clearance	225 mm	⇐
WEIGHT		
Curb weight	890 kg	840 kg
Gross axle weight rating, front	525 kg	⇐
rear	865 kg	⇐
Gross vehicle weight rating	1 390 kg	⇐

Introduction *(continued)*

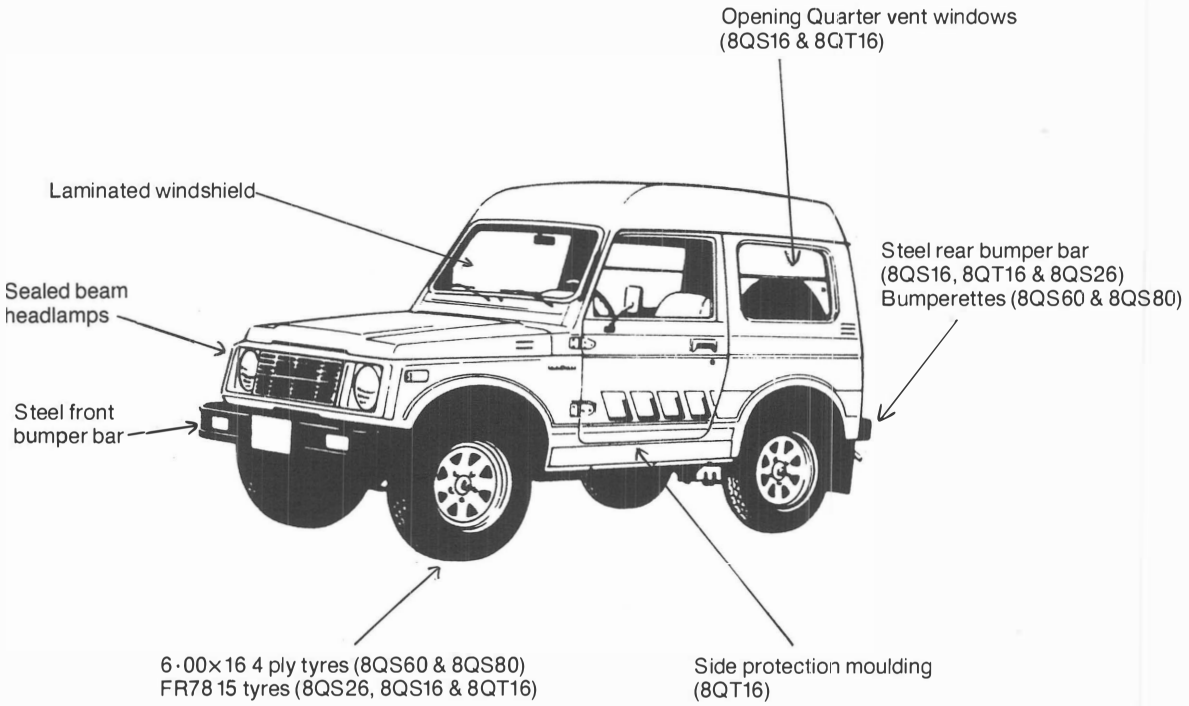
Drover QB Series vehicles are powered by a longitudinally mounted, 1·3 litre, overhead camshaft engine which drives the rear wheels through a five speed manual transmission (with overdrive 5th) and a two speed transfer gear box. Manually engaged free wheeling hubs on the front drive axles are standard on all models.

All Drover models are equipped with power assisted brakes; front disc and self-adjusting leading/trailing drum rear. The Park Brake is a drum type, mounted on the rear of the transfer gear box.

Steering is achieved through a variable ratio, recirculating ball steering box and a drag rod and tie rod assembly. A steering damper is installed between the Pitman arm and a chassis cross member.

Front and rear suspensions are of the semi-elliptical leaf spring type with double acting tubular shock absorbers.

Exterior Features


Opening Quarter vent windows
(8QS16 & 8QT16)
Laminated windshield
Sealed beam
headlamps
Steel front
bumper bar
Steel rear bumper bar
(8QS16, 8QT16 & 8QS26)
Bumperettes (8QS60 & 8QS80)
6·00×16 4 ply tyres (8QS60 & 8QS80)
FR78 15 tyres (8QS26, 8QS16 & 8QT16)
Side protection moulding
(8QT16)

EXTERIOR FEATURES

Radiator grille
Horizontal bars—body coloured

Front lamps
Headlamps—Flush mounted sealed beam
Park lamps—Mounted in bumper directly below headlamps.
Turn signal lamps—Mounted in bumper directly below headlamps alongside park lamps, also located on fender above bumper bar wrap around.

Rear lamps
Combination lamp incorporating stop/tail/backup.
Turn signals located in bumper (8QS16, 8QT16, 8QS26 models).
Otherwise end gate panel.
Licence lamp mounted on end gate panel or bumper bar.

Bumper bars
Steel Bumpers front. All models.
Steel Bumpers rear all except 8QS60, 8QS80 models.
Steel Bumperettes fitted to 8QS60 & 8QS80 models.

Fuel filler cap
Lockable type.

Rear view mirrors
Manually controlled exterior rear view mirror left and right hand sides.

Roll bar
Tubular steel (8QS26 models only).

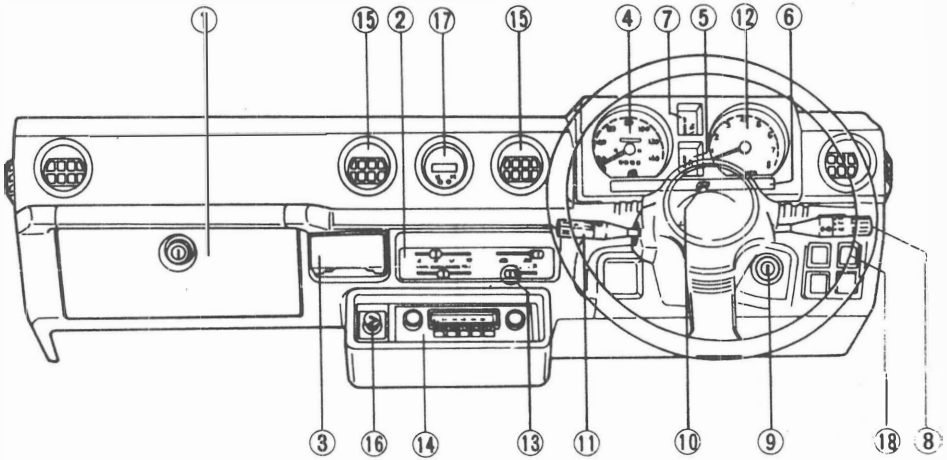
Glass
Windshield glass is laminated non-tinted.
Side and rear glass is armour plate. (Quarter vent windows with guard bars fitted to 8QS16 & 8QT16 models.)
Heated rear window (8QT16 model only).

Side protection moulding
Black moulding on lower body (8QT16 only).

Windshield wipers
Two speed self-parking. (Intermittent mode standard on 8QT16.)

Wheels and Tyres
16 inch diameter steel wheels, exposed wheel nuts. 6·00 × 16 × 4 ply tubeless tyres (8QS60/80).
15 inch diameter 8 spoke steel wheels with front and rear wheel arch extensions. FR78–15 tyres. (8QS16/26, 8QT16.)

Interior Features



① Glove box
② Heater control panel
③ Ashtray
④ Speedometer
⑤ Fuel gauge
⑥ Warning and indicator lights
⑦ Temperature gauge
⑧ Lighting switch/Turn signal and dimmer switch
⑨ Ignition switch
⑩ Hazard warning switch
⑪ Windshield wiper and washer switch
⑫ Tachometer (Where fitted)
⑬ Blower switch
⑭ Radio
⑮ Center ventilator
⑯ Cigarette lighter (Where fitted)
⑰ Clock (Where fitted)
⑱ Rear window defroster switch (Where fitted)

INTERIOR FEATURES

Instrument panel pad—Foam filled one piece moulding incorporates four face level adjustable fresh air vents, windscreen demisting slots and left and right hand fixed side window demisters.

Headlining

Vinyl headlining—Bonded (8QS16, 60 & 80).
Cloth (8QT16).

Interior lighting—Interior lamp with three-way switch.

Front seat—Front bucket seats. Reclining on 8QS26, 8QS16 & 8QT16. Passenger seat tilts on 8QS26, 8QS16 & 8QT16.
Covering—Cloth (with see-through head restraints—8QT16 only). Vinyl (without head restraints—8QS26, 16, 60 & 80).

Seat belts—Seat belts are non retracting.

Rear seats, (8QT16 model only)—Folding. Non retracting seat belts (2 places).

Instruments

Speedometer with trip meter	Located left hand side instrument panel
Fuel gauge	Centre of instrument panel—8QT16. Right hand side other models
Temperature gauge	Above fuel gauge—8QT16. Right hand side other models
Tachometer	Located right hand side instrument panel—8QT16 only.

Warning lamps—Low brake fluid level; Parking brake; Battery charge; Oil pressure; High beam; 4WD lamp.

Convenience items

AM radio and 1 speaker	Centrally mounted below heater controls
Illuminated heater controls	Mounted above the radio
Ashtray	Alongside the heater controls left hand side

Day/night internal rear view mirror—8QT16 only.

Steering column controls

Ignition switch/Steering lock	Right hand side of column
Combination stalk	Headlight and turn signal control right hand side. Wiper/washers left hand side
Horn	Steering wheel pad

Additional controls

Fuse block	Right hand side of dash
Heated rear window switch	Right hand lower on instrument pad 8QT16 only
Hazard warning switch	Above steering wheel on column

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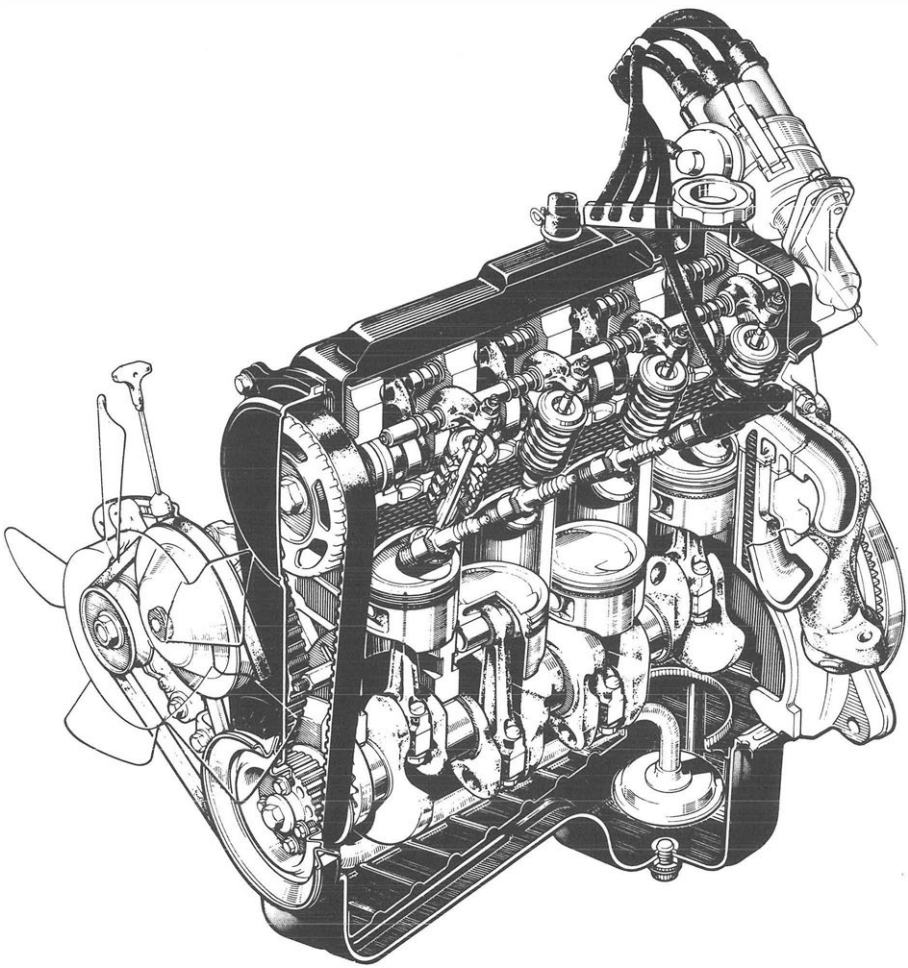
Brakes	99
Body electrical	101



Drover engine

MECHANICAL FEATURES

Engine

Essentially, the engine is the same unit as fitted to the Barina MB Series with differences due primarily to the longitudinal mounting of the engine and transmission assemblies.

For example: Engine oil filter
Engine oil pan
Engine oil pick-up screen and tube
Intake manifold
Exhaust manifold
Starter motor mounting
Air cleaner configuration

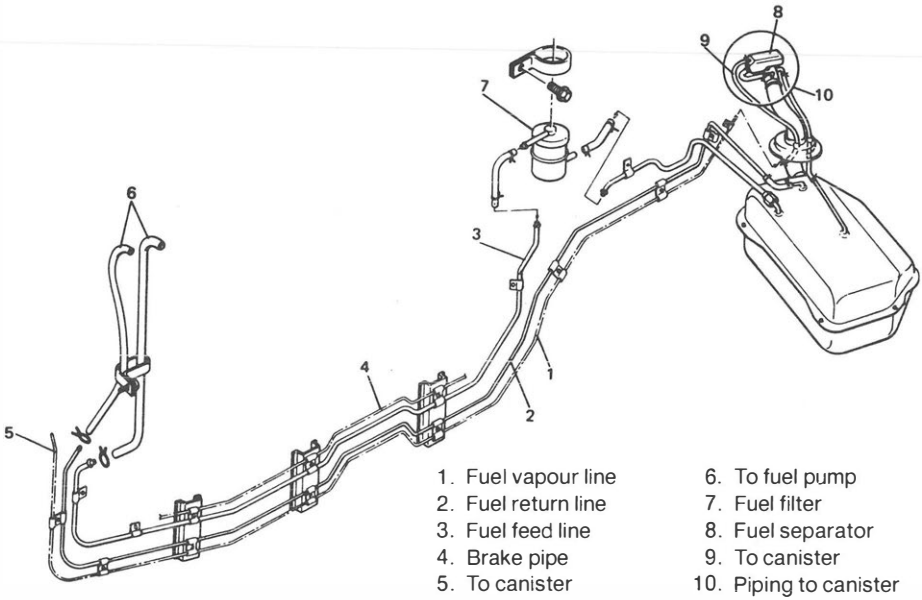
A six-bladed fan is bolted to the water pump hub.

Different pistons are used for the Drover engine.

Engine lubrication and sealing
Is identical to Barina.

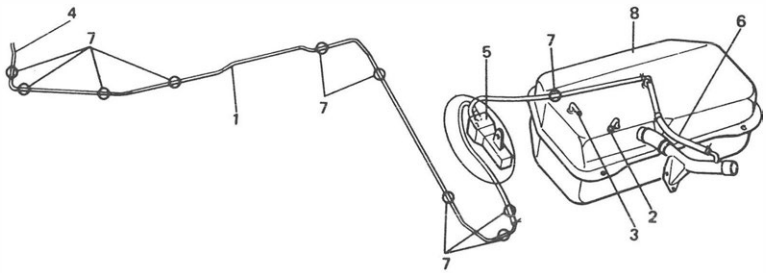
Engine cooling
Engine cooling system specifications are the same as Barina. As mentioned previously, the cooling fan is driven by the water pump. Drover has a larger coolant capacity and is fitted with a fan shroud. The 70% water, 30% ethylene glycol anti-freeze coolant solution also applies to Drover.

[For Canvas Top, Metal Top and Long Body Models]



1. Fuel vapour line
2. Fuel return line
3. Fuel feed line
4. Brake pipe
5. To canister
6. To fuel pump
7. Fuel filter
8. Fuel separator
9. To canister
10. Piping to canister

[For pick-up Model]



1. Fuel vapour line (Piping if fuel separator is provided)
2. To fuel filter
3. From fuel pump
4. To canister
5. Fuel separator
6. Fuel tank breather hose
7. Clamp position
8. Fuel tank

Fuel tanks and lines

Fuel System

Fuel Tank
While the capacity and shape are different to Barina, the fuel tank still has a three line system. There is no access through the body to service the fuel gauge sender unit. A vapour separator is mounted at the top of the fuel filler pipe, instead of the two-way check valve, fitted to Barina.

Fuel filter
The filter is mounted to a bracket on the right hand chassis rail, in front of the fuel tank. Replacement interval is 40,000 km.

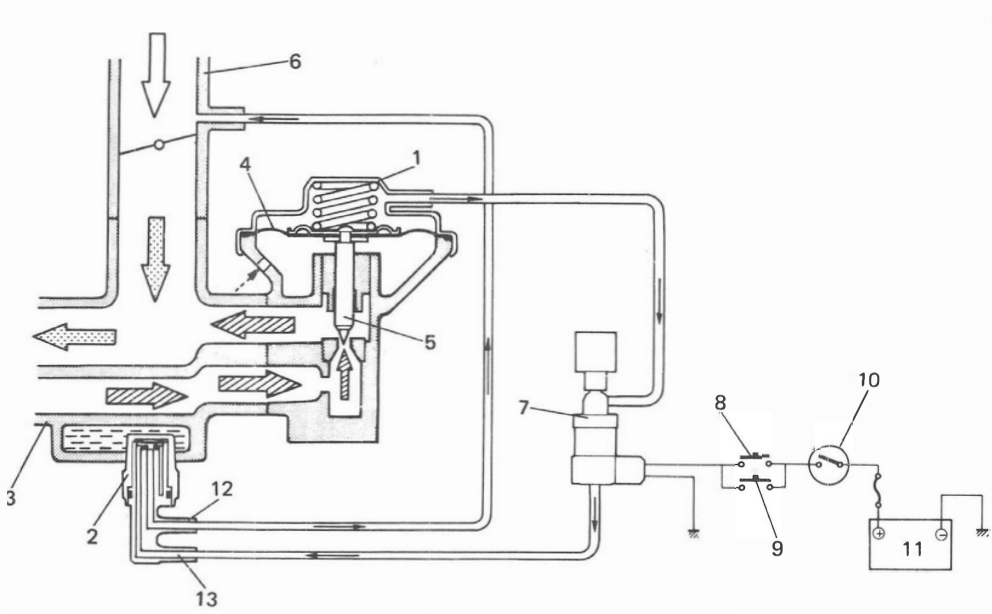
Fuel pump
Same as Barina.

Carburettor
There are some minor external differences which affect the operation of this carburettor when compared to the unit fitted to Barina.

IDLE-UP SYSTEM. While the mounting and appearance are different from Barina, the diaphragm action remains the same. As there is no electric engine cooling fan in this application, three electrical circuits can trigger the electric vacuum switching valve:

Headlamps (and/or park lamps)
Heater fan motor
Rear window demister

EGR system for Drover



Emission Control

Changes in emission control equipment over Barina, are as follows:

- **Dash pot**

Slows down the closing of the throttle, when decelerating.

- **Air pre-heat**

Dependent upon the setting of a manually controlled valve on the air cleaner duct, warm air may or may not be induced into the intake manifold. Three settings are provided:

1. Below −5°C—all air is pre-heated.
2. Between −5 and +15°C—a mix of ambient and warmed air is provided.
3. Above +15°C—no air is pre-heated.

Exhaust gas recirculation

There are some differences in the operation of the Drover EGR system compared to Barina. Ported vacuum still passes through a bi-metal vacuum switching valve (BVSV) (located in the thermostat housing on the intake manifold) when coolant temperature is above 60°C ± 4°C. Prior to activating the EGR valve however, vacuum has to pass through a "three way switching valve" (T.W.S.V.), which is open, until 4th or 5th gear is selected. An electric solenoid then closes off vacuum supply and, as air is then bled through a filter in the end of the T.W.S.V., the EGR valve closes immediately.

1. Vacuum controller
2. Distributor cap
3. Seal
4. Distributor housing
5. Distributor driven gear
6. Pin
7. O-ring
8. Rotor
9. Signal generator dust cover
10. Ignitor dust cover
11. Signal generator
12. Ignitor
13. Generator base plate
14. Signal rotor

Distributor

Engine Electrical

IGNITION SYSTEM

Distributor

The distributor fitted to Drover has different advance characteristics to the Barina type but all servicing details remain the same.

Coil

A different coil is fitted with revised winding resistances.

Spark Plugs

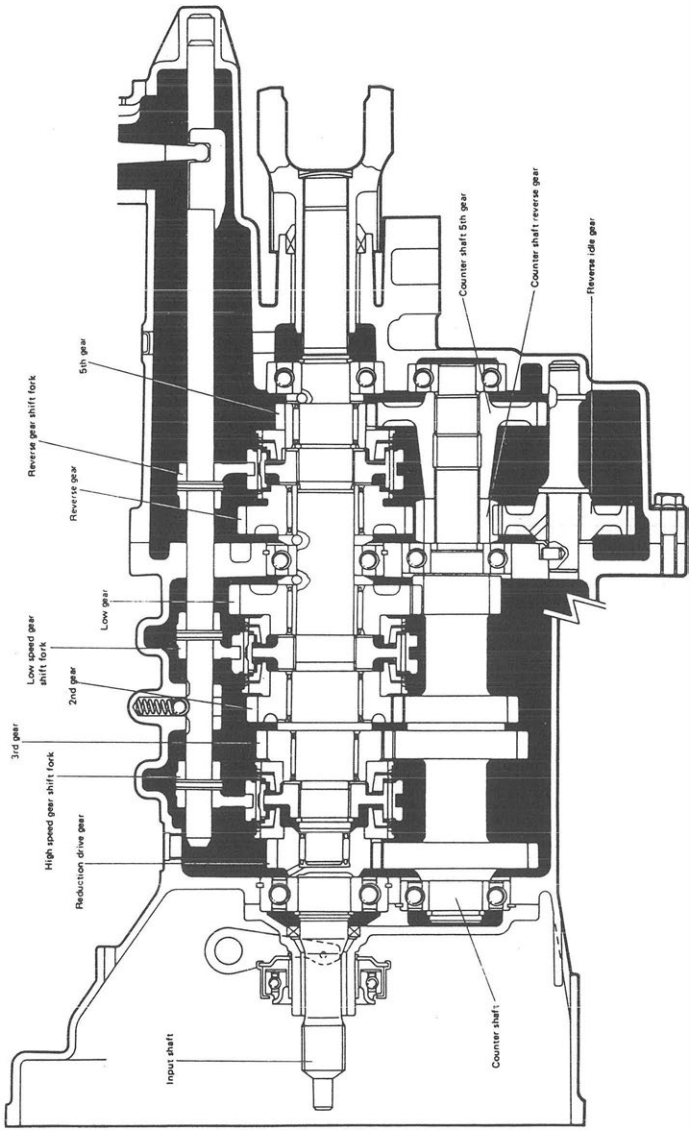
One range hotter is recommended for Drover—NGK BP5ES.
The gap remains the same (0.7–0.8 mm).

CRANKING SYSTEM

Apart from a different drive end housing to accommodate the revised mounting. The starter motor is basically the same as fitted to Barina.

CHARGING SYSTEM

The charging system for Drover is the same as fitted to Barina.



Drover 5 speed transmission

TRANSMISSION

The transmission has five forward ratios and one reverse. Fifth gear is an overdrive.

The assembly consists of three main aluminium cases—an extension case and an upper and lower transmission case. The upper and lower cases split at the mainshaft centre line. All cases are sealed with RTV sealant.

With the exception of the bushed reverse idler gear, all shafts are supported on single row, ball races.

Both the mainshaft and countershaft have intermediate ball races for additional support.

Transmission gear ratios are:

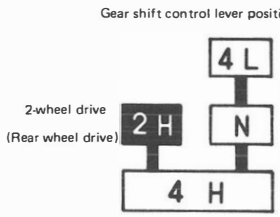
Low	3.650:1
2nd	1.946:1
3rd	1.422:1
4th	1.000:1
5th	0.793:1
Reverse	3.463:1

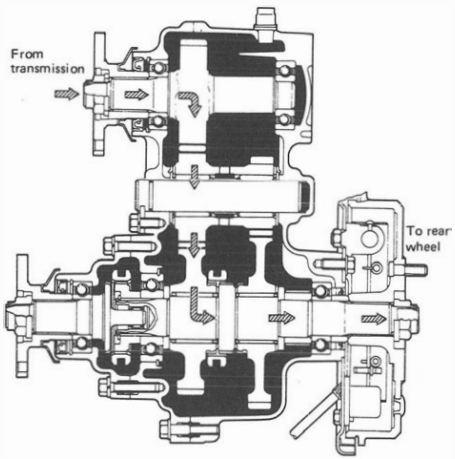
The reverse/fifth selector shaft has spring loaded shift yokes fitted to it, which effectively prevent a fifth to reverse selection, on downshift.

2-Wheel Drive (Rear-Wheel Drive)

Rear shifter fork pushes rear clutch sleeve into "high" gear, thus coupling the gear to output rear shaft.

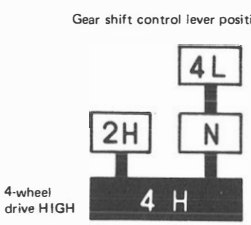
Drive flows from input shaft to output rear shaft through big gear, "high" gear and rear clutch.

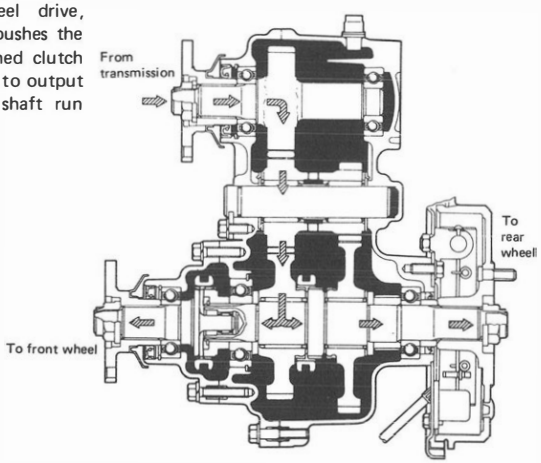




4-Wheel Drive HIGH (All-Wheel Drive on HIGH)

Under the conditions of rear-wheel drive, described above, front shifter fork pushes the sleeve of front clutch onto the toothed clutch ring, thus coupling output rear shaft to output front shaft. Front shaft and rear shaft run together on HIGH.





TRANSFER GEARBOX

The two functions of this auxiliary transmission are:

- Selection between 2 and 4 wheel drive.
- Selection between high and low ratio for the four wheel drive mode only.

The functions are achieved by means of four shafts arranged in a three axis configuration and two, non-synchronised, sliding clutches. Selection is effected by actuating these clutches from a single control lever, located beside the driver's seat.

The transfer gearbox is mounted separately between the chassis rails and has three propeller shafts attached.

The output to the rear wheels has a transmission park brake.

When the four wheel drive mode is selected (high or low ratio) an indicator lamp is lit on the instrument cluster.

Transfer gearbox ratios are:

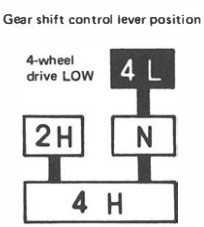
low range	2.268:1
high range	1.409:1

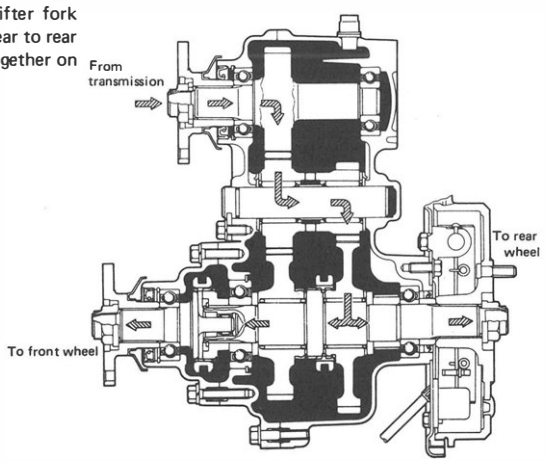
Transfer gearbox power flow

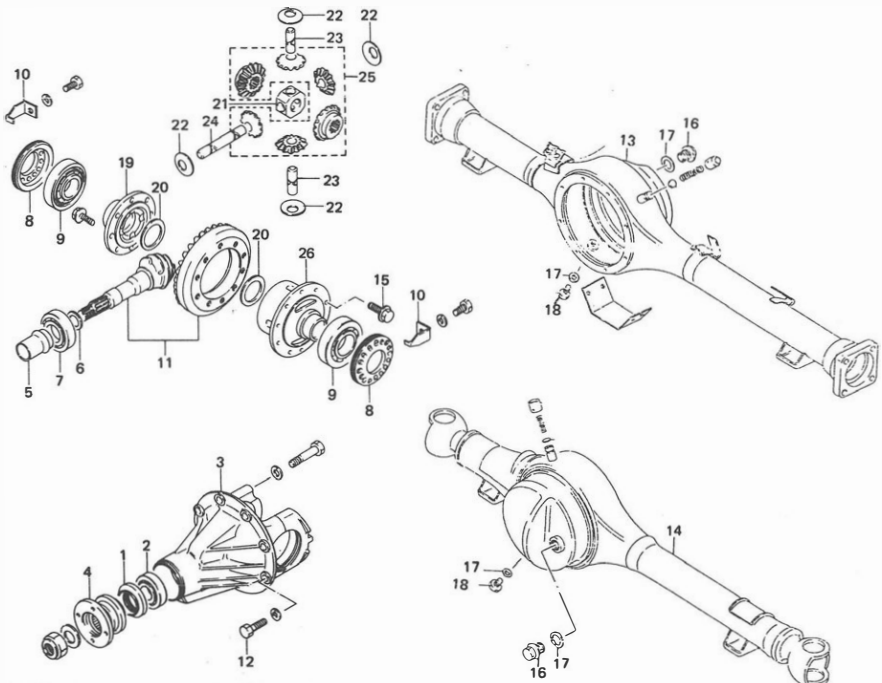
Power flows associated with each range selected, are shown in the accompanying diagrams.

4-Wheel Drive LOW (All-Wheel Drive on LOW)

Front shifter fork actuates front clutch to couple rear shaft to front shaft; and rear shifter fork actuates rear clutch to couple "low" gear to rear shaft. Front shaft and rear shaft run together on LOW.







1. Oil seal
2. Bearing
3. Carrier
4. Joint flange
5. Bearing preload adjusting spacer
6. Shim
7. Bearing
8. Bearing adjuster
9. Side bearing
10. Adjuster lock plate
11. Bevel gear pinion set
12. Bolt
13. Rear axle housing
14. Front axle housing
15. Bolt
16. Oil level plug
17. Gasket
18. Oil drain plug
19. Right case
20. Thrust washer
21. Joint
22. Thrust washer
23. Pinion shaft No. 2
24. Pinion shaft No. 1
25. Side gear set
26. Left case

Final drives—front and rear

FINAL DRIVES

Both front and rear final drive carrier assemblies are identical.

The crown wheel and drive pinion are hypoid gears and each is supported by a pair of taper roller bearings. Pinion pre-load is controlled by a collapsible spacer. Crown wheel carrier bearing pre-load is set by threaded adjusters, which are also used to adjust crown wheel to drive pinion backlash.

The differential contains two side gears and four pinions. Selective thrust washers are fitted under the side gears to determine backlash.

The final drive ratios are 3.909:1

Front suspension

FRONT SUSPENSION

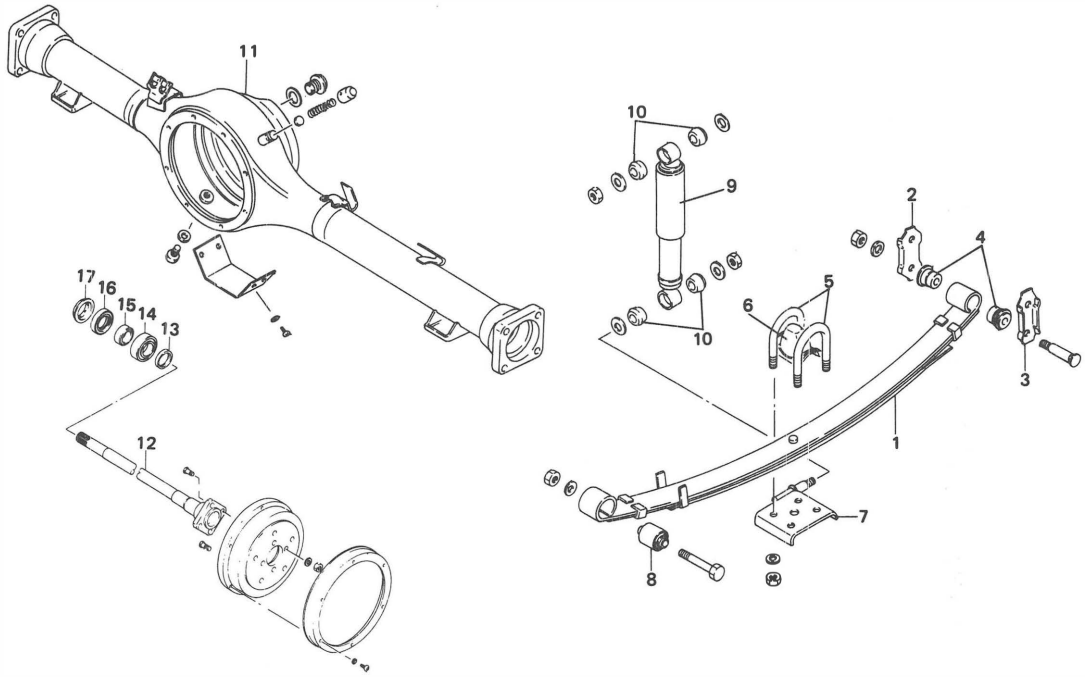
The front axle assembly is supported by rubber bushed semi-elliptic leaf springs, which are dampened by non-serviceable, tubular shock absorbers.

Body roll is controlled by a rubber mounted stabilizer bar.

Front hubs are supported by twin taper roller bearings.

Manually operated, free wheel hubs are fitted to overcome unnecessary rotation of the front, final drive.

Front axles have non-serviceable Barfield constant velocity universal joints fitted to their outer ends.

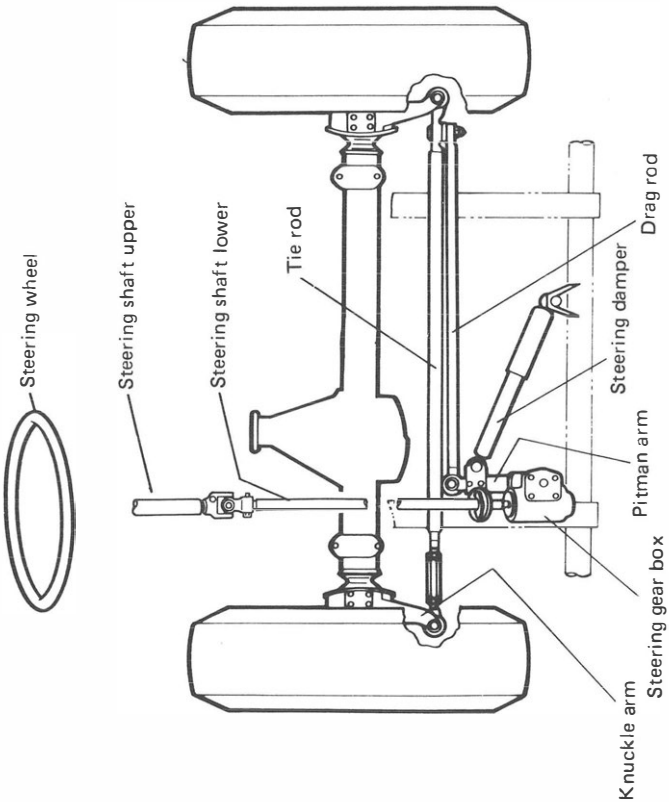


1. Leaf spring
2. Shackle plate inner
3. Shackle plate outer
4. Shackle bush
5. U bolt
6. Spring bumper
7. Spring seat
8. Spring bush
9. Shock absorber
10. Bush
11. Axle housing
12. Axle shaft
13. Spacer
14. Bearing
15. Bearing retainer ring
16. Oil seal
17. Oil seal protector

REAR SUSPENSION

The two stage semi-elliptic springs are mounted with rubber bushes and damping is achieved by gas filled, shock absorbers.

The semi-floating rear axles are supported at their outer ends by single row ball races.



Drover steering system

STEERING

The variable ratio (15.6–18.1:1), recirculating ball steering box transmits turning effort from the steering wheel, through a drag rod and tie rod, to the front wheels.

To ensure steering stability, a damper is mounted between the Pitman arm and a chassis cross member.

Camber, caster and steering axis inclination are non-adjustable.

One adjustable sleeve is fitted to the right hand end of the tie rod, to permit toe-in adjustments.

Shim adjusted, taper roller bearings are fitted to the front knuckles, providing a pivot point for steering.

As the oil seal fitted to each knuckle serves the dual purpose of oil retention and steering damping, replacement intervals for off-road operating, are specified as every 10,000 km.

1. Master cylinder
2. Proportioning valve
3. Parking brake lever
4. Transfer
5. Center (parking) brake

Brake hydraulic system—diagonal split design

BRAKES

The braking system for Drover is a diagonal or front to rear split design (depending on model) with 289 mm front discs and 220 mm rear drums.

The tandem master cylinder has a bore diameter of 20.64 mm and the power booster, an effective diameter of 180 mm.

Front calipers are the same as Barina but are mounted on top of the steering knuckle support.

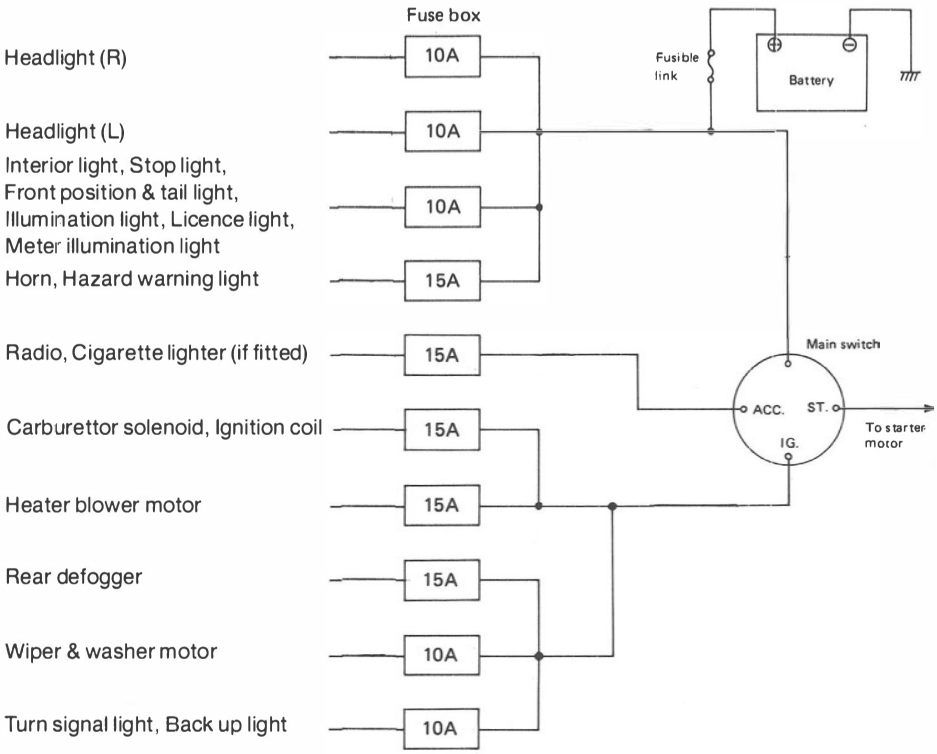
The proportioning valve is mounted on the inner, right hand chassis rail, below the master cylinder/booster assembly.

The park brake is mounted on the rear wheel output end of the transfer gear box and is a mechanically operated, internal expanding, two shoe assembly, acting on a 180 mm diameter drum, mounted on the rear wheel output shaft.

Park brake shoe adjustment is manual, by turning the notched, screw adjusters. Access is through a plugged hole in the drum.

The rear brakes are self-adjusting and are of similar format to Barina.

Drover fuse layout



BODY ELECTRICAL

Similar circuitry to Barina, is used.

A fusible link is fitted, no relays are used and battery voltage is applied to most components, with the switch providing the earth return.

Fuses

Ten (10) blade type fuses are used for individual circuit protection and are located in the fuse block, under the dash, above the accelerator pedal.

Location, purpose and value of individual fuses, are as shown.

Windshield wipers and washers

Drover models are fitted with two speed wipers (high or low speed). 8QT16 models feature an "intermittent" mode.

SPECIFICATIONS AND SERVICE DATA INDEX

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Differential 110
Suspension 110
Carburettor 110
Steering System 111
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Specifications

Item \ Models	Canvas Top Metal Top (Van)	Long Body & Pick-up
ENGINE		
Type	Four-stroke cycle, water cooled, OHC	←
Number of cylinders	4	←
Lubrication system	Wet sump	←
Bore	74.0 mm	←
Stroke	77.0 mm	←
Piston displacement	1,324 cm^3	←
Compression ratio	8.9 : 1	←
Carburettor	AISAN two-barrel down draft	←
Air cleaner	Polyester fiber element (Dry type)	←
ELECTRICAL		
Ignition timing	10° B.T.D.C. at 850 rpm	←
Standard spark plug	NGK BP-5ES or NIPPON DENSO W16EX-U	←
Starter	Magnetic shift type	←
Generator	Alternator	←
Battery	12V, 108 kC (30 Ah)/20HR or 12V, 162 kC (45Ah)/20HR	←
Headlight	12V, 65/55W	←
Turn signal light	12V, 21W	←
Clearance light	12V, 5W	←

Item \ Models		Canvas Top Metal Top (Van)	Long Body & Pick-up
Tail/Brake light		12V, 5/21W	←
Side turn signal light		12V, 5W	←
Licence plate light		12V, 5W	←
Back-up light		12V, 21W	←
Interior light		12V, 5W	←
Meter pilot light		12V, 3.4W	←
Main fuse		0.5 mm^2 (fusible link)	←
Fuse box		10/10/10/15/15/15/15/15/10/10A	←
POWER TRANSMISSION			
Clutch type		Dry, single disc	←
Transmission type		5-forward all synchromesh, 1 reverse	←
Final reduction ratio		3.909	←
Gear ratios	low	3.650	←
	2nd	1.946	←
	3rd	1.422	←
	4th	1.000	←
	5th	0.793	←
	reverse	3.463	←
Transfer gear ratios	low range	2.268	←
	high range	1.409	←
Overall reduction ratios:			
Low range	low	32.359	←
	2nd	17.252	←
	3rd	12.606	←
	4th	8.865	←
	5th	7.030	←
	reverse	30.701	←
High range	low	20.103	←
	2nd	10.718	←
	3rd	7.832	←
	4th	5.507	←
	5th	4.367	←
	reverse	19.073	←

Item \ Models		Canvas Top Metal Top (Van)	Long Body & Pick-up
WHEELS AND SUSPENSION			
Tyre size: Front and rear		FR78-15	6.00-16-4PR
Tyre pressure	front	140 kPa	←
	rear	140 kPa unladen	210 kPa, *4 180 kPa laden
		180 kPa laden	
Suspension type	front	Leaf spring	←
	rear	Leaf spring	←
STEERING			
Turning radius		4.9 m	5.7 m
Steering gear box		Ball nut type	←
Toe-in		2 – 6 mm	←
Camber angle		1° 00′	←
Caster angle		3° 30′	←
King pin angle		9° 00′	←
BRAKE SYSTEM			
Type		4-wheel, hydraulic	←
Wheel brake	front	Disc brake (floating caliper type)	←
	rear	Drum brake (leading and trailing)	←
Parking brake		Mechanical actuated on propeller shaft	←
CAPACITIES			
Cooling solution		5.0 ℓ	←
Fuel tank		40 ℓ	←
Engine oil		3.5 ℓ	←
Transmission oil		1.3 ℓ	←
Differential gear box oil	front	1.5 ℓ	←
	rear	1.3 ℓ	←
Transfer gear box oil		0.8 ℓ	←

[*4] For Long body

Service Data

ENGINE

Item				Standard
Compression pressure				14.0 kg/cm² (199.0 psi)/400 r/min (rpm)
Valve lash (clearance)		Cold (When coolant temperature is 15 ~ 25°C or 59 ~ 77°F)	Inlet	0.13 ~ 0.17 mm
			Exhaust	0.16 ~ 0.20 mm
		Hot (When coolant temperature is 60 ~ 68°C or 140 ~ 154°F)	Inlet	0.23 ~ 0.27 mm
			Exhaust	0.26 ~ 0.30 mm
Cylinder head	Valve seat	Seating width	Inlet	1.3 ~ 1.5 mm
			Exhaust	1.3 ~ 1.5 mm
		Seating angle		45°
	Valve guide hole diameter (In & Ex) (over size)			12.030 ~ 12.048 mm
Valve, valve spring & cam shaft	Camshaft/Journal clearance			0.050 ~ 0.091 mm
	Cam height (Base circle + lift)		Inlet	37.500 mm
			Exhaust	37.500 mm
			Fuel pump cam	40.000 mm
	Valve stem diameter		Inlet	6.965 ~ 6.980 mm
			Exhaust	6.950 ~ 6.965 mm
	Valve guide I.D.		Inlet	7.000 ~ 7.015 mm
			Exhaust	7.000 ~ 7.015 mm
	Valve guide-to-valve stem clearance		Inlet	0.020 ~ 0.050 mm
			Exhaust	0.035 ~ 0.065 mm
	Thickness of valve head periphery		Inlet	1.0 mm
			Exhaust	1.0 mm
	Contact width of valve and valve seat		Inlet	1.3 ~ 1.5 mm
			Exhaust	1.3 ~ 1.5 mm
	Valve spring free length		Inlet	49.3 mm
			Exhaust	49.3 mm
	Valve spring preload		Inlet	24.8 ~ 29.2 kg for fitting length 41.5 mm
			Exhaust	24.8 ~ 29.2 kg for fitting length 41.5 mm

Item			Standard
Rocker arm shaft and rocker arm	Rocker shaft O.D.		15.973 ~ 15.988 mm
	Rocker arm I.D.		16.000 ~ 16.018 mm
	Shaft-to-arm clearance	Inlet	0.012 ~ 0.045 mm
		Exhaust	0.012 ~ 0.045 mm
Cylinder	Flatness of gasketed surface		0.03 mm
	Cylinder bore (S.T.D.)		74.00 ~ 74.02 mm
	Cylinder-to-piston clearance		0.02 ~ 0.04 mm
Piston	Piston diameter	Standard	73.970 ~ 73.990 mm
		Oversize: 0.25 mm (0.0098 in.)	74.220 ~ 74.230 mm
		Over size: 0.50 mm (0.0196 in.)	74.470 ~ 74.480 mm
	Piston ring groove width	Top ring	1.22 ~ 1.24 mm
		2nd ring	1.51 ~ 1.53 mm
		Oil ring	2.81 ~ 2.83 mm
	Piston pin diameter		16.995 ~ 17.000 mm
Piston ring	Piston ring thickness	Top ring	1.17 ~ 1.19 mm
		2nd ring	1.47 ~ 1.49 mm
		Oil ring	0.45 mm
	Ring clearance in groove	Top ring	0.03 ~ 0.07 mm
		2nd ring	0.02 ~ 0.06 mm
	Piston ring end gap	Top ring	0.20 ~ 0.33 mm
		2nd ring	0.20 ~ 0.35 mm
		Oil ring	0.20 ~ 0.70 mm
Crank shaft			
	Crank pin diameter		41.982 ~ 42.000 mm
	Crank pin clearance in con. rod		0.030 ~ 0.050 mm
	Connecting rod small end bore		16.968 ~ 16.979 mm
	Crank journal diameter		44.982 ~ 45.000 mm
	Bearing-to-journal clearance		0.020 ~ 0.040 mm

Item			Standard
Crankshaft			
	Crankshaft thrust play		0.11 – 0.31 mm
	Connecting rod big end side clearance		0.10 ~ 0.20 mm

CLUTCH & TRANSMISSION

Item			Standard
Clutch	Pedal free travel		20 ~ 30 mm
	Facing wear (Rivet head depth)		1.2 mm
	Clutch release arm play		2 ~ 4 mm
Transmission	Clearance between gears and rings	Low & high	1.0 ~ 1.4 mm
		5th speed	1.2 ~ 1.6 mm
	Key slot width of synchronizer ring		10.1 mm
	Gear shift fork shaft spring free length		25.5 mm
	Gear backlash		0.06 ~ 0.15 mm

LUBRICATION

Item			Standard
Lubrication			
	Oil relief valve spring	Free length	45 mm
	Set pressure of oil pressure switch		0.2 ~ 0.4 kg/cm^2
	Engine oil pressure		3.0 ~ 4.2 kg/cm^2 (42.7 ~ 59.7 psi) at 3,000 r/min (rpm)

COOLING SYSTEM

Item		Standard
Cooling system	Fan belt tension as deflection under 10 kg (22 lb) push applied to middle point between pulleys	6 ~ 9 mm
	Thermostat start-to-open temperature	82°C
	Thermostat full-open temperature	95°C
	Valve lift	8 mm

DIFFERENTIAL

Item		Standard
Differential	Bevel gear backlash	0.10 ~ 0.15 mm
	Side gear thrust play	0.12 ~ 0.37 mm
	Pinion bearing preload	1.8 ~ 3.4 kg

SUSPENSION

Item		Standard
Suspension	Front wheel bearing starting preload	1.0 ~ 3.0 kg
	Axial play in barfield joint	0 mm (No play)
	Knuckle arm starting torque (without oil seal)	1.0 ~ 1.8 kg

CARBURETTOR

Item			Standard
Engine idle speed			850 ± 50 r/min
Engine idle speed when lighting switch "ON"			950 ± 50 r/min
Float level	When measuring with special tool		20.5 ~ 23.5 mm
	Float height		7 mm
Accelerator cable play (when engine is cold)	Auto choke type	(cold)	10 – 15 mm
		(hot)	3 ~ 5 mm
Accelerator pump stroke			3.8 ~ 4.2 mm

STEERING SYSTEM

Item	Standard
Gear ratio	15.6 ~ 18.1
Steering angle, inside	29°
Steering angle, outside	26°
Steering wheel play	10 ~ 30 mm

BRAKES

Item	Standard
Front brake disc thickness	10 mm
Front brake pad thickness (lining + pad rim)	15.0 mm
Rear brake lining thickness (lining + shoe rim)	7.0 mm
Rear brake drum inside diameter	220 mm
Pedal-to-wall clearance: When pedal is depressed at 30 kg	75 mm minimum

ELECTRICAL

Item		Standard
Ignition system	Ignition order	1 – 3 – 4 – 2
	Signal rotor air gap	0.2 ~ 0.4 mm
	Generator resistance	130 ~ 190 ohms
	High tension cord resistance	16 kΩ/3.3 ft (1 m)
	Ignition coil; Primary coil resistance (20°C)	1.20 ~ 1.46 ohms
	Ignition coil; Secondary coil resistance (20°C)	8.5 ~ 11.5 kiloohms
	Spark plug gap	0.7 ~ 0.8 mm

	Item	Standard
Starter motor	Voltage	12 Volts
	Output	0.8 kw or 0.9 kw
	Rating	30 seconds
	Brush length	17 mm
	Number of pinion teeth	8
	Commutator diameter	32 mm
	Mica depth	0.4 ~ 0.6 mm
	Commutator out of round	0.05 mm or less
	Brush spring tension	1.6 kg
Charging system	Nominal operating voltage	12 Volts
	Maximum alternator output	45A
	Maximum permissible alternator speed	15,000 rpm
	Working temperature range	−30 ~ 90°C
	Rotor; Ring-to-ring circuit resistance	2.8 ~ 3.0 ohms
	Brush length	11.0 mm
	Standard output voltage and current	14.2 ~ 14.8 Volts, 10A maximum
	Regulated voltage	14.2 ~ 14.8 Volts